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26
Manuals
1799

*Notified in
A.C.Is. for the
week ending
8th March,
1939*



Small Arms Training

Volume I, Pamphlet No. 7

·303-inch Machine Gun

Part II.—Training

1939

LONDON

Printed under the Authority of HIS MAJESTY'S STATIONERY OFFICE
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By Command of the Army Council,

H. J. Creed

THE WAR OFFICE,
8th March, 1939.

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GENERAL

Small Arms Training, Vol. I, Pamphlet No. 7, Part II, deals in general with the handling of the gun. It aims at training gun numbers in drill, and the application of drill to ground, thus fitting a man to take his place as a member of a machine gun team in battle.

It further aims at training headquarters of platoons and sections in their duties in the field.

The drills are arranged to meet the average conditions of mobile warfare. Latitude must be exercised in their application. For example, in an extensive programme shoot Nos. 2 may require assistance.

These drills are generally appropriate to cavalry. The duties given for the infantry are applicable to equivalent ranks in the cavalry.

DEFINITIONS

(See also S.A.T., Vol. I, Pamphlet No. 7, Part III.)

Arc of fire.—Arc over which it is desired that the guns can bear from a given gun position. Its boundaries are described as “right of arc” and “left of arc”.

Auxiliary aiming mark.—A gun aiming mark indicated by the fire controller in the target area, with the object of maintaining fire on the target. It is employed when, for any reason, a point of aim on the target is not used.

Deflection.—A lateral displacement of the lines of any or all guns.

Direct fire.—When the gun is laid directly on the target by means of the backsight and foresight.

Fire control.—The necessary arrangements and orders for hitting the target.

Fire controller.—The individual responsible for giving the orders for the engagement of a target to the men of a fire unit.

Fire direction.—The term applied to instructions given by the commander of more than one fire unit to the fire unit commanders as to how their fire is to be applied.

Gun aiming mark.—A mark on which a gun is laid to cause the bullets to strike the correct position on the target for that gun.

In action.—A machine gun is said to be in action when it is mounted with reference to its arc of fire and the necessary men, equipment and ammunition are present at the gun to enable fire to be opened when ordered.

Indirect fire.—When the gun is laid to hit a given target by other means than by laying on it direct.

Laying.—The process of elevating (or depressing) and traversing a gun until its axis is made to point in any given direction. On conclusion of this process the gun is said to be laid.

Line.—The direction in which a gun or guns are pointed.

Near limit of arc.—The near edge of the zone on which fire is required.

Observed fire.—When the effect of the fire can be observed from the gun or from the fire controller's observation post.

Observation post.—A post from which a particular area can be kept under observation or from which artillery and machine gun fire can be controlled and corrected.

Pivot gun.—The gun used as a basis for calculation.

Position in readiness.—The position at which the guns are taken off the vehicle or pack animals preparatory to coming into action. It will normally be the nearest point to the gun positions to which the vehicle or pack animals can be brought.

Registering.—The recording of the direction and elevation necessary to hit any given target as found by ranging.

Rendezvous.—A pre-arranged place of assembly (R.V.).

Zero line.—A line of reference, on which all guns are parallel, and from which switches are measured.

Safety Precautions

On all occasions when the gun and dummy cartridges are used for instructional purposes the instructor will carry out the following safety precautions :—

- i. Inspect all locks to ensure that the striker does not protrude through the firing pin hole.
- ii. Inspect all ammunition to ensure that all cartridges are dummies.

NOTE.—When instruction is being given in mechanical subjects, D.P. stores, if available, will always be used.

SECTION 11.—ELEMENTARY GUN DRILL

1. During elementary gun drill the gun will be mounted to suit the sitting position, but emphasis will be laid on the fact that, on active service, the tripod will always be adjusted to suit the ground and available cover.

2. The object of elementary gun drill is to render the man proficient in the duties of gun numbers in handling the weapon.

3. It aims at teaching the man :—

- i. To mount and dismount the gun.
- ii. To load and unload the gun.
- iii. To bring the gun into action.
- iv. To cease firing.
- v. To adjust the sights and lay the gun.
- vi. To fire the gun, to stop firing, and to go on firing.
- vii. Consistency of tap and adjustment of clamp, traversing and the swinging traverse.
- viii. Controlled corrections, direct and indirect fire.

Instructor's Notes

Methods of carrying out the drill.

1. The stores required vary according to the portion of the drill which is being carried out, but for all drills the squad requires a gun, tripod, spare parts case complete, condenser can and tube, and two belt boxes with belts and dummy cartridges. When additional stores are required, details are given in the instructional notes. The condenser tube used will consist of a piece of $1\frac{1}{2}$ -inch rope, six feet long.

2. Laying out the stores.—Before the squad falls in, the gun and tripod will be placed in line on the ground a few paces apart, tripod on the left with the legs to the rear : the muzzle of the gun pointing to the front, the condenser tube attached, and the spare parts case close to and on the right of the gun. The belt boxes and condenser can will be placed about a pace apart with the condenser can on the right a few paces in rear of the gun and tripod.

3. Fall in.—The squad is fallen in, in single rank. The instructor details any three men. He falls them in a short distance in rear of the stores and numbers them off. The remainder of the squad under instruction is placed in such a position that the maximum benefit is derived although they themselves are not at the moment acting as Nos. 1, 2 or 3.

If at any time the instructor wishes to change round Nos. 1, 2 and 3, he should order "Fall out 1". No. 1 becomes No. 3, No. 2 becomes No. 1 and No. 3 becomes No. 2, the detachment renumbering at once, the instructor detailing three fresh numbers to take their place when he wishes to do so.

4. The instructor must see that the standard of drill is maintained throughout, that the Nos. remain still and correctly placed on the completion of any necessary movement, particularly in the sitting or lying positions.

When the instructor wishes to explain, criticize or demonstrate, he will first order "Rest" to allow of relaxation of the muscles. Before the drill is resumed he will ensure that the Nos. adopt the correct position, alert and ready for any order. This will be effected by the order "Position".

So far as is possible, the duties of No. 1 will first be taught, and practised by the whole squad. The instructor will then teach and practise the duties of Nos. 2 and 3 in that order, before drilling the detachment collectively.

5. The orders given by the instructor are given in inverted commas at the head of each paragraph. All orders will be given verbally.

LESSON 45.—TAKE POST

"Take post".

The detachment will turn to the right, with the exception of No. 1. No. 1 doubles forward and lies down on the left of the tripod. He inspects the tripod to see that the elevating and crosshead joint pins are properly in position and turned down, both elevating screws equally exposed, traversing clamp sufficiently tight to prevent the crosshead from swinging round when the tripod is being carried, the crosshead over the rear leg, direction dial secure, and all three legs together and clamped securely.

When Nos. 2 and 3 have reported to him, he reports "All correct" (or otherwise), to the instructor.

No. 2 doubles forward, lies down on the right side of the gun. He places the strap of the spare parts case on his right shoulder, and inspects the gun to see that the muzzle attachment is correctly adjusted and the condenser tube fitted, the feed block is in the gun, and the front cover locked, the sliding shutter is closed, the tangent sight set at 600, the lock is in the gun, and the "T" fixing pin is screwed home and vertical. He reports "Gun correct" (or otherwise) to No. 1.

No. 3 doubles forward and lies down between the condenser can and belt boxes. He inspects the belt boxes to see that the

rounds are in the front of the belts and pointing the right way. He closes and fastens the boxes. He inspects the condenser can to see that the cap is screwed in position and that the filler is secure. He reports "Ammunition and condenser can correct" (or otherwise), to No. 1.

All Nos. will now lie facing forward with their arms folded.

Note.—When the ground is too wet, the detachment should be instructed to kneel instead of lying down, but waterproof sheets should be used to avoid this when possible.

LESSON 46.—MOUNT AND DISMOUNT GUN

Instructor's Notes

The instructor will indicate to No. 1 the spot over which the socket is to be mounted and the direction in which the gun will point. This spot should be a few yards in front of No. 1.

The action of No. 1 in mounting and dismounting the TRIPOD will be taught first, ending and beginning respectively at the point where No. 1 is seated behind the tripod, and has withdrawn the pins.

The remaining duties of No. 1 and the duties of Nos. 2 and 3 will then be taught in that order.

"Mount gun".

No. 1 jumps to his feet, picks up the tripod and doubles forward with it, placing it on the ground with the socket on the spot indicated. Standing astride the legs, he loosens both jamming handles simultaneously, grasps the crosshead bracket as far forward as possible with both hands, and with a forward and upward movement, erects the tripod (Plate 6). Supporting the tripod with the left hand at the crosshead bracket, the left forearm resting on the thigh, he ensures that the rear leg is on the ground and the socket upright over the spot indicated, and tightens up both jamming handles with the right hand if possible. After putting a final pressure with each hand on the jamming handles, he sits down behind the tripod, removing the elevating and crosshead joint pins.

As soon as No. 2 places the gun on the tripod No. 1 hands No. 2 the crosshead joint pin, and grips the left traversing handle with the left hand. When No. 2 has inserted the crosshead joint pin, No. 1 will insert the elevating joint pin and turn the handle down. He levels the gun by means of the elevating wheel, tests by tapping the traversing handles to see if the adjustment of the traversing clamp is approximately correct, tightening or loosening it if necessary, and sits, looking straight in front of him, with his elbows supported by the inside of his

thighs, his third and little fingers round the traversing handles, forefingers on top, second finger underneath the safety catch, and thumbs resting lightly on the thumbpiece.

No. 2 opens the sliding shutter, and, picking up the gun with his left hand grasping the right traversing handle and his right arm over the barrel casing, doubles forward to the right side of the tripod, arriving about the time No. 1 is removing the pins. He sinks on to the left knee, places the gun on the tripod, supporting the barrel casing with his right thigh, and with his right hand drives in the crosshead joint pin which No. 1 has handed to him, finally turning the handle down (Plate 7). He retains his hold with his left hand on the right traversing handle until the pin is home. He lies down on the right of the gun, looking towards the gun, his head in line with, but below, the level of the feedblock. When No. 3 has brought up the belt boxes and condenser can, No. 2 places the former in line with the feedblock, and inserts the condenser tube into the latter.

No. 3 disengages the quick release strap of the belt boxes and unscrews, but not completely so, the cap of the condenser can. He doubles forward to the right side of the gun, carrying the belt boxes in his left hand, the condenser can in his right, arriving just as No. 2 lies down. He places the condenser can in a suitable position near the tripod, and the belt boxes within easy reach of No. 2, with the quick release strap towards the feed block. He removes the cap of the condenser can, doubles back to a suitable position and lies down.

Note.—When the gun has been mounted and Nos. 1, 2 and 3 are in position, the instructor should remark whether :—

The actions of Nos. 1, 2 and 3 and their final positions were correct.

The tripod is mounted with reference to the direction indicated.

The gun is level and cross-head over the rear leg.

The socket is upright and over the spot indicated.

The tripod is at a suitable height for No. 1 (until No. 1 has been taught to mount the gun in service positions the instructor will see that the rear leg is suitably adjusted before the gun is mounted).

The sliding shutter is open.

The traversing clamp is not too loose.

The elevating and cross-head joint pins are home and locked.

The jamming handles are really tight.

The belt boxes are close to and in line with the feed block, with the quick release strap disengaged, condenser can in position and tube inserted in it.

The squad will be shown how to correct a leaning mounting on the first occasion it arises.

PLATE 6
ERECTING THE TRIPOD

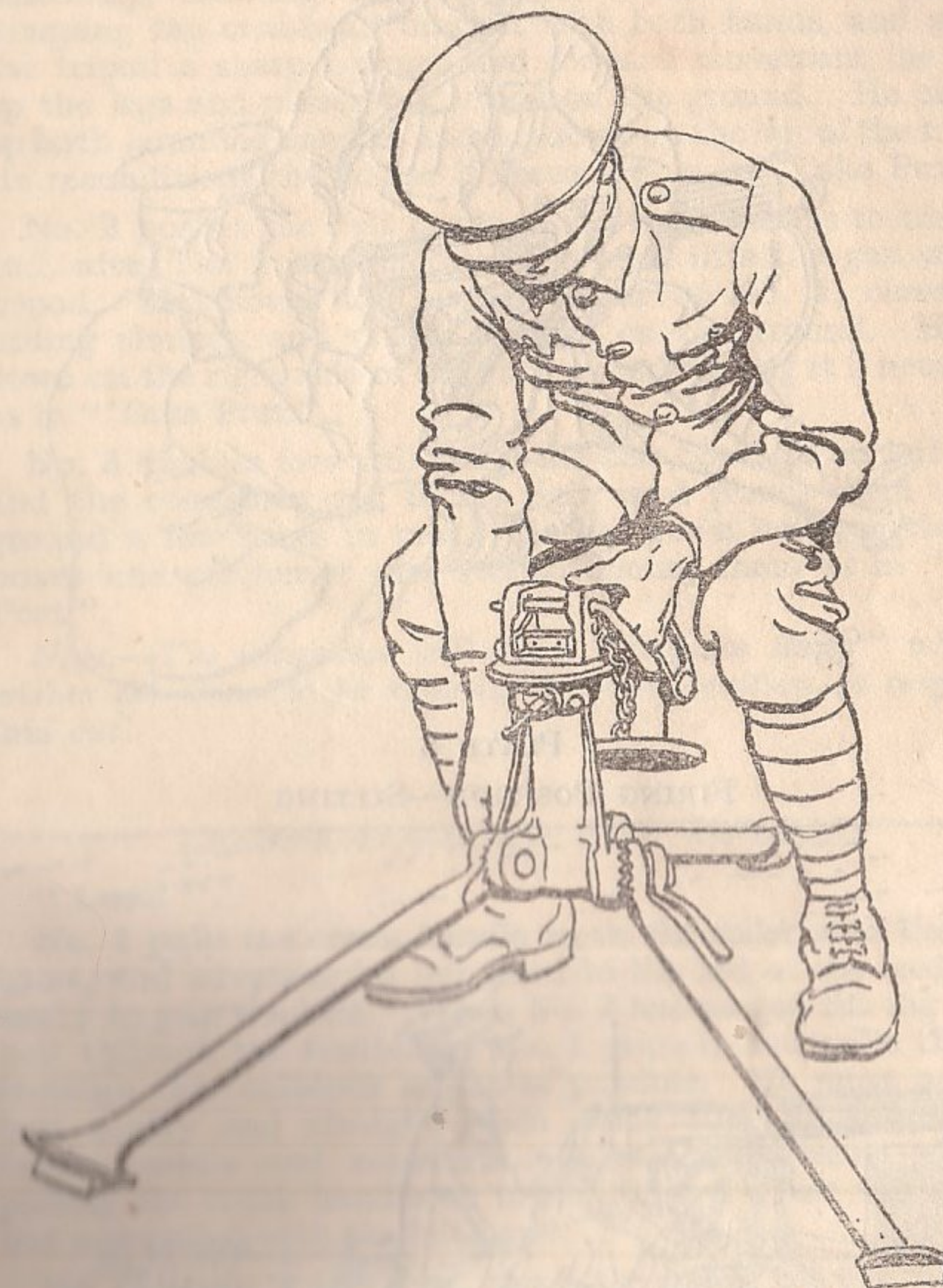
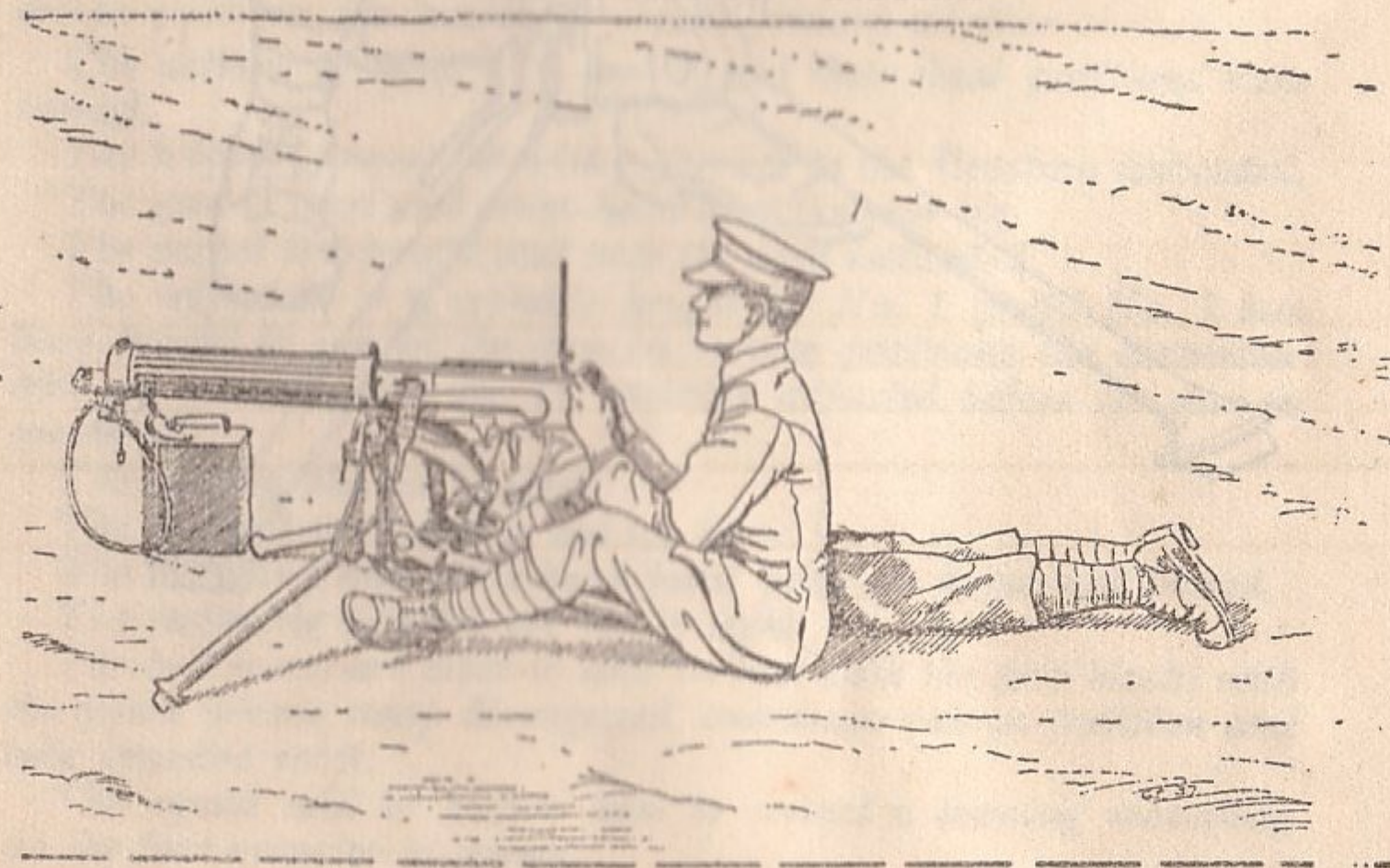


PLATE 7
MOUNTING THE GUN



PLATE 8
FIRING POSITION—SITTING



"Dismount gun".

No. 1 removes both pins, steadies the gun with his right hand, and, after No. 2 has removed the gun, replaces the pins and turns the handles down. He jumps to his feet, stands astride the tripod and loosens both jamming handles simultaneously, allowing the tripod to collapse on the ground. Grasping the crosshead bracket with both hands, and giving the tripod a sharp upward and forward movement, he folds up the legs and places the tripod on the ground. He clamps up both jamming handles and lies down on the left of the tripod. He reconditions the tripod if necessary as in "Take Post."

No. 2 pushes the belt boxes to the right, jumps to his feet, and, after No. 1 has removed the pins, lifts the gun off the tripod. He moves to the right clear of No. 1, closes the sliding shutter, and places the gun on the ground. He lies down on the right side of the gun, reconditioning it if necessary as in "Take Post."

No. 3 doubles forward, seizes the belt boxes in his left hand and the condenser can in his right, and places them on the ground a few paces in rear. He lies down between the belt boxes and condenser can, reconditioning them as in "Take Post".

Note.—The instructor will order "Replace stores" when he wishes the stores to be returned to their position as originally laid out.

LESSON 47.—LOAD AND UNLOAD

"Load".

No. 1 pulls the crank handle on to the roller with the right hand, and advances his left hand to the left of the feedblock, ready to grip the belt. When No. 2 has passed the tag of the belt through the feedblock, No. 1 grips it and pulls the belt through the feedblock as far as possible. He must pull the belt gently and straight when doing so. He releases the crank handle and repeats the above movements. Whilst pulling the crank handle on to the roller the belt will be held but not pulled with the left hand.

No. 2 opens a belt box, seizes the end of the belt with the right hand at the point where the tag joins the fabric, forefinger along the tag and pushes the tag through the feedblock as far as possible. He must ensure that the belt is not twisted on entering the feedblock.

Emphasize that the belt must be pulled gently and straight through the feedblock. The men must avoid the natural

tendency to pull it to the rear, *i.e.* towards No. 1, which might prevent the round being fed correctly into the feedblock.

Should any man exhibit a tendency to slur the loading motions it may be advisable to make him load "by numbers", counting aloud while doing so.

The actions of Nos. 1 and 2 in loading and unloading will be taught together.

"Unload".

If the tangent sight has been in use it will be lowered by the No. 1, using his left hand. At the same time, without touching the belt, he pulls the crank handle on to the roller twice in succession with the right hand, allowing it to fly forward again in each case. He presses the top and bottom pawls of the feedblock with his right hand, the top pawls with the fingers and the bottom with the thumb, taking care to keep his hand clear of the entrance to the feedblock. When the belt is being withdrawn and the last round is clear of the feedblock, he will press the thumbpiece.

No. 2 withdraws the belt from the feedblock when No. 1 presses the pawls, steadying the belt with his left hand near the belt box and his right hand near the feedblock. He packs the belt correctly in the box and closes the lid.

LESSON 48.—ACTION AND CEASE FIRING

"Action".

Nos. 1, 2 and 3 perform the duties learnt in "Mount gun" and "Load", the gun being loaded as soon as it is correctly mounted (Plate 8).

"Cease firing".

Nos. 1, 2 and 3 perform the duties learnt in "Unload" and "Dismount gun", the gun being dismounted as soon as it has been unloaded correctly.

LESSON 49.—CLEAR GUN AND STAND CLEAR

"Clear gun".

No. 1 pulls the crank handle on to the roller, raises the rear cover, removes the lock from the lock guides, and eases the crank handle forward, allowing the lock to rest against the hinge of the rear cover. He reports "Gun clear".

Note.—If it is desired to replace the lock in the gun and close the rear cover, but not to load the gun, the command "Lock in—cover down" may be used. If the gun is loaded, "Clear gun" will be preceded by "Unload".

"Stand clear".

Nos. 1, 2 and 3 jump to their feet and stand at ease in rear of the gun, No. 2 on the right.

Note.—The order "Take post" will be used when it is desired that Nos. 1 and 2 should adopt their positions at the gun.

LESSON 50.—TO ADJUST THE SIGHTS AND LAY THE GUN

Instructor's Notes

Before the lesson is begun, instruction in aiming must have been given.

A few simple targets will be pointed out, the object being not to teach recognition, but clean and accurate handling by the No. 1.

The instructor should order "Lay" when he wants No. 1 to do so.

If no natural aiming points are available, a landscape target may be used, being placed at any convenient distance from the gun.

The gun will be loaded before the exercise begins.

"... hundred (or fifty) ... Indication ... lay".

No. 1 raises the tangent sight and adjusts the slide to the range ordered. When ordered he begins to lay the gun by tapping the gun until the correct direction is obtained, and elevating or depressing until the aim is correct. He orders No. 2 to loosen the traversing clamp when a large change in direction is necessary, and to tighten the clamp again when the gun is roughly aligned on the target. No. 1 retests his clamp.

When tapping the gun, or turning the wheel, No. 1 maintains control of the gun by keeping the disengaged hand on the traversing handle. When the gun is laid he orders "On" to No. 2, who raises his left hand in line with No. 1's shoulder; at the same time No. 1 raising the safety catch with his second fingers.

Should No. 1 fail to understand an order at any time he will call "Repeat".

LESSON 51.—FIRE, STOP, AND GO ON

"Fire".

No. 1 instantly presses in the thumbpiece as far as possible by a quick and even movement of the thumbs, keeping his eyes directly on the target. He will fire in bursts, keeping

the thumbpiece pressed for four or five seconds before releasing and pressing again, occasionally checking his aim between bursts. No. 2 lowers his hand.

"Stop".

No. 1 immediately releases pressure on the thumbpiece and safety catch. He checks his aim, relaying on to the original point of aim if necessary.

Note.—The wheel should occasionally be turned while No. 1 is firing, in order to ensure correct relaying when "Stop" is ordered.

"Go on".

No. 1 resumes the action as detailed under "Fire".

LESSON 52.—CONSISTENCY OF TAP AND ADJUSTMENT OF CLAMP

Instructor's Note

The gun will be loaded.

1. To teach a consistent tap.

The object is to develop a consistent automatic tap, in order that the line of sight is displaced the same amount each time the gun is tapped.

Each man will be practised in tapping the gun in both directions. The instructor noting the consistency. Correct holding will be taken after each tap.

Note.—The instructor will explain the following points :—

- i. A strong tap with a tight clamp is preferable to a weak tap with a loose clamp.
- ii. When tapping with either hand, the gun must be held correctly with the other hand, and the safety catch kept raised.
- iii. The eyes must be directed to the front, and not at the rear end of the gun or along the sights.

2. To adjust the clamp.

Instructor's Note

Additional stores :—M.G. target (S.A.T., Vol. V, 1931, Plate 66).

The gun will be mounted and loaded 25 yards from the target.

The object is to ascertain the degree of tightness required in the traversing clamp in order that the line of sight may be displaced 15 minutes each time the gun is tapped.

The instructor will teach how to test and adjust the clamp. He will explain to the men that the interval between bulls, at a distance of 25 yards, subtends 15 minutes. He will ensure that if the gun moves too much or too little when the men are testing the clamp, that the clamp is altered and not the tap.

Whenever the gun is mounted or a new No. 1 takes post at the gun, No. 1 tests the adjustment. The instructor should point out the importance of this and also the importance of the "feel" of the correct tightness, as later on no row of bulls will be available to assist in the adjustment.

3. Combination of consistency and adjustment.

The instructor will inform the No. 1 which way he has to tap and will then give a suitable range and order to get the gun laid on to one end of a horizontal row of bulls.

When ordered No. 1 will lay the gun on to the bull's-eye indicated.

On the order "Fire", No. 1 fires a burst, releases pressure on the thumbpiece, and strikes the traversing handle, deflecting the gun through an angle of 15 minutes. He fires another burst, taps as before, and will continue to do so, firing a burst after each tap until ordered to stop.

Note.—The instructor will explain that the object of this exercise is to test the man's consistency of tap and adjustment of clamp and will warn the No. 1 that in this particular case he will not check his aim or relay between bursts or on the command stop.

NOTES.—1. The men will be exercised in traversing in both directions.

2. Progressive instruction will be given in tapping right and left on a M.G. target.

LESSON 53.—TRAVERSING

Instructor's Notes

Additional stores :—M.G. target (S.A.T., Vol. V, 1931, Plate 66).

The instructor will explain that the object of this lesson is that in traversing the firer will combine consistency of tapping with maintenance of the line of sight on the target.

For drill in traversing the gun will be mounted and loaded 25 yards from the M.G. target.

The instructor will inform the No. 1 which way he has to traverse ; and will then give a suitable range and order to get the gun laid on to one end of an oblique row of bulls.

No. 1 proceeds as in Lesson 52 (3), except that after each tap, before firing again, he relays his gun on to the target immediately above or below the point to which his tap has carried it.

NOTE.—The instructor will warn the No. 1 in order that his accuracy of traversing may be ascertained, he will **not** check his aim or relay on the command "Stop".

LESSON 54.—SWINGING TRAVERSE

Instructor's Note

Additional stores :—M.G. target (S.A.T., Vol. V, 1931, Plate 66).

No. 1 loosens his traversing clamp and then lays as before on the right or left end of the target. When ordered to fire, he swings the gun slowly to the right or left maintaining pressure on the thumbpiece throughout. He moves the gun, not by a movement of the forearms alone, but by keeping the upper part of the body fairly rigid and forcing it over in the required direction.

Note.—*Explain that this method of traversing is only employed against linear targets at very close ranges, when the normal method of traversing is likely to prove too slow.*

The following points will be explained :—

- i. *The traversing clamp must not be so loose that No. 1 loses control of the gun, the vibration of the gun rendering it easy to swing.*
- ii. *The rate of movement should be such that the line of sight is moved about 1 yard in two seconds, when the target is 25 yards from the gun. The movement of the gun is almost imperceptible.*
- iii. *The thumbpiece should be pressed before the gun begins to move.*
The importance of the mounting being upright must be emphasized.
- iv. *The above principles will be only explained to the men, as proficiency can only be obtained when the gun is being fired.*

LESSON 55.—CONTROLLED CORRECTIONS, DIRECT

Instructor's Notes

The gun will be loaded and fire opened before the lesson begins.

The object is to teach No. 1 to relay the gun after altering the sights in obedience to a correction in elevation.

"Stop . . . Up (or Down) . . . Go on".

No. 1 adjusts his sights in accordance with the order, relays on to his original point of aim by turning the handwheel and continues firing.

LESSON 56.—CONTROLLED CORRECTIONS, INDIRECT

Instructor's Notes

Additional Stores :—Dial sight and aiming post.

The gun will be mounted, dial sight attached, and an aiming post put out about 15 yards in front and to a flank. A suitable range will be set on the range drum of the dial sight, and the Instructor will adjust the collimator to the aiming post.

Before this lesson No. 1 must have received instruction in the use of the graduations on the elevation drums of the dial sight. He should have an elementary knowledge of the functions of the aiming post.

1. Elevation.

The object is to teach the No. 1 to relevel the bubble after adjusting the range drum or angle of sight drum of the dial sight in obedience to a correction in elevation.

i. **"Stop . . . Up (or Down) . . . Hundred (or Fifty) . . . Go on".**

No. 1 adjusts the range drum as ordered, elevates or depresses the gun by turning the handwheel until the bubble is central.

ii. **"Stop . . . Up (or Down) . . . Min. . . . Go on".**

No. 1 adjusts the angle of sight drum as ordered, elevates or depresses the gun by turning the handwheel until the bubble is central.

2. Deflection.

The object is to teach the No. 1 to relay on to the aiming post, after adjusting the deflection drum in obedience to a correction in deflection.

"Stop. Right (or Left) . . . degrees . . . minutes".

No. 1 adjusts the deflection drum as ordered, then taps the gun over until the aim is again relaid on to the aiming post. When relaid the bubble should be central; if not, the No. 1 will centralize it by turning the handwheel and readjust the collimator on to the aiming post.

SECTION 12.—TESTS OF ELEMENTARY GUN DRILL AND INSTRUMENTS

1. The following tests have been devised to assist officers in testing the efficiency of their men in elementary gun drill, and to ensure that no detail of the drill is overlooked. It is important that these tests should not be considered solely as competitions against time, for although quickness is necessary, accuracy is the first essential. No man should therefore be passed as efficient unless all the points are correctly carried out, even though he may complete them in the standard time. Whilst passing the tests for accuracy, men who slightly exceed the standard time should be tested again before being put back for further instruction.

2. The tests must be carried out in strict accordance with the detailed instructions given under the appropriate paragraphs of elementary gun drill, for unless the smallest details are insisted upon, the time limit will not be applicable. In carrying out the tests time can be saved if the first detachment complete tests 1 to 4 consecutively, the remainder can be carried out as convenient.

3. Other ranks, except full rank N.C.Os., will qualify annually in tests 1 to 9. Full rank N.C.Os. will qualify in their first year only, in the machine gun company.

It should be noted in tests 1, 2, 3 and 4 that all numbers are being tested in their own particular duties as No. 1, No. 2 or No. 3, and the tests should not be regarded as a test of the No. 1 only. Therefore a man is not considered to have passed these tests until he has passed in the duties of all numbers.

4. It is essential for each man to have passed tests 1 to 9 before proceeding with the A.M.G.C.

A record will be kept by each company commander and produced for inspection as required.

5. Method of conducting the tests.

The conditions of the test will be explained before the test begins, including the time allowed for the test, and when the time allowance begins and finishes.

NOTE.—If a stop watch is not available, a time keeper must be appointed.

Stores required :—As for all E.G.D. in tests 1—8.

Words of command will be given as in the appropriate heading in E.G.D.

Test No. 10 will be carried out by full rank N.C.Os. only.

Name of test	Conditions before test	Number of tests	Time allowed	To pass	Remarks
(1) No. 1. Mount gun.	(2) Nos. 1, 2 and 3 will take post. Stores laid out not more than 5 yards from the place where the gun is to be mounted. Gun mounted. Belt box closed, quick release strap undone. Nos. 1 and 2—Take post. Gun mounted and loaded. Nos. 1 and 2—Take post.	(3) One	(4) Twenty seconds from command "Gun" until all numbers are still.	(5) All points of E.G.D. correct.	(6)
No. 2. Load	Gun mounted. Belt box closed, quick release strap undone. Nos. 1 and 2—Take post.	One	5 seconds from command "Load" until No. 1 has got correct holding.	Gun correctly loaded.	
No. 3. Unload	Gun mounted and loaded. Nos. 1 and 2—Take post.	One	5 seconds from command "Unload" until belt box is closed.	Gun correctly unloaded.	
No. 4. Dismount gun.	Gun mounted. Nos. 1, 2 and 3—Take post.	One	15 seconds from command "Gun" until all Nos. are still.	All points of E.G.D. correct.	
No. 5. To adjust the sights and lay the gun.	The gun will be loaded. Three targets will be pointed out. Tangent sights lowered and set at 600x. Nos. 1 and 2—Take post. Gun mounted 25 yds. from the M.G. target and loaded. No. 1 will be given an opportunity to test his clamp. The M.G. target will not be used for this purpose. Nos. 1 and 2—Take post.	Three	12 seconds from the range being ordered until No. 2 holds up his hand.	Sight set correctly and accurately aim.	No. 1 will not be informed of the order in which the targets will be given out. Different ranges will be ordered for each target.
No. 6. Traversing.		Two	No time limit imposed.	When checked at any time, to be within 15' for direction. Elevation to be correct.	The test consists of traversing from left to right and from right to left. A complete row of oblique bulls will be traversed in each case. The order "Stop" will be

<p>given out, but not before the centre of the traverse has been reached. The aim will be checked after the order "Stop" and when the end of the traverse is reached. Tapping back to correct errors is not allowed.</p>					
No. 7. Controlled corrections. (a) Direct fire.	Gun mounted, loaded, and laid on a target. Nos. 1 and 2—Take post.	Three	6 seconds from the command "Hundred" until No. 1 presses the thumbpiece.	Sight correctly adjusted and correctly relayed.	Corrections up or down will not exceed 300 yards. One of these tests will be carried out with No. 1 wearing his gas respirator.
(b) Indirect fire. (Elevation).	Gun mounted and loaded, dial sight attached aiming post put out. Range drum set at any range. Angle of sight drum at zero. The bubble will be central and a correct aim laid on the aiming post. Nos. 1 and 2—Take post.	Three	10 seconds from the command "Hundred" until No. 1 has pressed the thumbpiece.	Correct setting on the range drum and the bubble level within 2 minutes.	Corrections up or down will not exceed 300 yards. The error in levelling the bubble will be ascertained by using the angle of sight drum.
(c) Indirect fire. (deflection).	As in (b) above. Range drum and angle of sight drum to be at zero.	Three	15 seconds from the command "minutes" until No. 1 has retained his holding.	Correct setting on the deflection drums. Bubble central to within 2 minutes. Aim correctly relaid on aiming post.	Corrections right or left will not exceed 4° and will always include 10s of minutes. Bubble checked by angle of sight drum.

Name of test	Conditions before test	Number of tests	Time allowed	To pass	Remarks
(1) No. 8. Laying the gun for elevation, indirect.	(2) Gun mounted, dial sight attached. All scales set at zero. Gun approximately level.	(3) Three	(4) 10 seconds from the command "Hundred" until No. 1 has retained his holding.	(5) Correct setting on the range and angle of sight drums. Bubble level to within 2 minutes.	(6) Ranges ordered will be between 1,200 and 2,000 yards. Angle of sight of not more than 1° plus or minus will be ordered, and will include 5 minutes. In order that the time taken to give out the order will not interfere with the time allowed for the test, the angle of sight will be given immediately after range.
No. 9. Immediate action. Additional stores as for teaching I.A.	4 guns will be mounted about three yards apart. Stoppages set up, crank handles covered and the guns laid off the aiming mark. The testing N.C.O. at each gun will have a spare lock and clearing plug. One stoppage in each position will be set up. Special stoppages not to be included. NOTE.—The testing N.C.O. will act as No. 2.	One (Carry out I.A. on 4 guns.)	No time limit imposed. Average time used in assessing points (see remarks).	Not less than 60 points.	The test consists of rectifying the stoppage of all four guns in turn. The No. 1 being tested will be warned that when he has carried out the I.A. on a gun, he will immediately double to the next gun, until the last gun is reached. Time will be taken from the command "Go" until the testing N.C.O. calls "Up" when the I.A. is complete on the last gun. The time is taken of each individual, and the average time worked out and points awarded as follows:—

No. 10. Director. Stores required:— 1 Director. 1 aiming post.	An aiming post will be put out to represent a gun, a director will be mounted 50 yards in front of it. The elevation scales set at zero, bubble approximately central, the index plate clamped at 180° and the socket unclamped. The target on which the director is to be laid will be indicated. The director will be laid within 10° either side of the target.	One	30 seconds from the command "Go" until the angles have been called out.	Angles correct within 10 minutes for direction and within 5 minutes for elevation.	<p>The angle of sight to the target (which must be clearly defined) must not exceed 1° plus or minus.</p> <p>The N.C.O. being tested will lay on the target and measure the angle of sight. He will then measure the angle of direction to the aiming post. Both angles being called out.</p>
<p>Deductions:—</p> <p>Totally incorrect, 20 points.</p> <p>Partially incorrect, 5 points.</p> <p>Guns not relaid, 5 points.</p> <p>Incorrect aim, 2 points.</p> <p>Minor errors, 2 points.</p> <p>Not changing lock when required, 10 points.</p>					

SECTION 13.—SIGNALS

1. In addition to the signals already taught in Infantry Training, 1937, Secs. 30-32, the following signals are necessary for fire control and use in the field by machine gun units.

2. They will be more easily remembered if, instead of being taught in one lesson, they are introduced when the relative stage of training is reached.

3. Fire control signals.—

Signal	Interpretation	When taught
(1) No. 2 with his hand raised in line with and behind the shoulder of No. 1.	(2) Gun ready to fire.	(3) Whilst teaching adjusting the sights and laying the gun, E.G.D.

NOTE.—On the order wind, No. 2 will lower his hand. He will raise his hand again when No. 1 has made the necessary allowance.

Both arms fully extended, raised from the sides to a position level with the shoulders and lowered again. This motion is repeated quickly several times.	Action.	} Before and during section drill, direct fire.
Arm swung in a circular motion in front of the body.	Cease firing.	
Fire controller with his hand raised above the shoulder.	Prepare to fire.	
Fire controller's hand lowered to the side.	Fire.	
Fire controller's arm waved horizontally to and fro.	Stop.	

NOTE.—No. 2 will order No. 1 to stop.

Fire controller—
Semaphore

U	Up 50 yards or 10'	} During platoon drill, indirect.
N	Down 50 yards or 10'	
T	Right 30'	
L	Left 30'	

4. Field signals.—

A. Platoon serjt. or Section comdrs. or Section cpls.	} to join immediate superior.	} Before section training.
AA. All N.C.Os. to joint platoon comdr.		
B. More ammunition required.	} During section drill.	
H. Trucks to come forward.		
W. Water required.		

SECTION 14.—ADVANCED MACHINE GUN HANDLING

The object is to adapt the lessons taught in elementary gun drill as far as possible to service conditions.

This subject provides an essential link between drills and collective training, and should be taught to the men as soon as they are proficient in elementary gun drill. It should be practised again within each section at the beginning of the period allotted for section training.

LESSON 57.—MAN-HANDLING OF LOADS

Instructor's Note

Stores :—

Gun, tripod, condenser can, and tube, five belt boxes with belts and dummy cartridges. Spare parts case: all to be at service weights.

1. Explain and demonstrate.—

The methods of carrying the gun, tripod, etc., taught in drills are not always the most convenient for carrying long distances, or when concealment from ground observation is necessary. Any comfortable method may be adopted, which does not damage the load, and which conceals from the enemy the nature of the load carried. The following methods are suggested :—

i. Tripod.—

- (a) Walking or doubling.—Under the arm or in front of the body.
- (b) Crawling.—Any convenient method. The tripod may be dragged along the ground provided that the dial is not damaged.

ii. Gun.—

- (a) Walking or doubling.—Across the body, barrel casing resting on the right forearm, left hand gripping the left traversing handle and free end of the condenser tube ; or

Close to the right side with the muzzle pointing upwards. It will be held at the crosshead bracket with the right hand, the free end of the condenser tube may be pushed through the traversing handle.

- (b) Crawling.—The man will lie on his right side, head to the front, weight of the body supported on the right elbow, right knee bent. He will support the gun with the barrel casing resting on the right forearm, the breech casing on the inside of the right thigh. He will grasp the left traversing handle with the left hand, which will also contain the free end of the condenser tube. He will crawl forward making use of his right elbow and left leg.

iii. Belt boxes and condenser can.—

- (a) Walking or doubling.—One belt box under each arm, and one belt box or condenser can in one hand.
- (b) Crawling.—Any convenient method may be adopted. A suggested method is that the leather handles of a belt box may be hung over the toe of the man's boot. By this method the man can crawl on his side with two belt boxes, one on either foot and can hold the condenser can in one hand.

iv. Two-man load.—

NOTE.—The gun will be unloaded before the movement described below is carried out.

- (a) If it is required to move a gun and tripod, which have already been mounted, a short distance to a new position, the whole may be carried by two men as follows :—
No. 1, right hand on the rear leg, left hand, containing one belt box, on the left front leg.
No. 2, left hand, containing one belt box, on the right front leg, condenser can in the right hand.
- (b) The gun mounted on the tripod can be moved by two men crawling forward, each grasping a front leg.

2. Practise squad.

LESSON 58.—MOUNTING THE GUN ON EXPOSED GROUND

Instructor's Note

Stores :—

As for Lesson 57.

- 1. The instructor will explain to the men that the mounting taught to them during drills is not always the most suitable

under service conditions owing to the necessity for concealment and the unevenness of the ground.

2. Explain and demonstrate:—

i. Mounting and dismounting the tripod.

To mount the tripod.—

No. 1 crawls forward with the tripod, placing it over the spot indicated. Keeping as low as possible on the left of the tripod with his head to the front, he loosens the jamming handles of the two front legs and opens them by rocking the tripod, first to one side and then to the other. He adjusts the rear leg so that when the tripod is mounted it will be at its minimum height.* He raises the tripod until the socket is upright and clamps up the front legs. It may be more convenient when mounting the tripod to adjust each front leg separately, rocking the tripod as described above.

An alternative method of Mounting the Tripod.—

Before giving him the order "**Mount gun**", the No. 1 will now be told to set the rear leg at an angle suitable for the selected gun position. In addition, the two front legs will swing forward and upward and clamped in a suitable position over the rear leg.

To dismount the tripod.—

No. 1 will loosen the front and rear leg jamming handles, and adjust the rear leg to the sitting position. He will close the legs together and tighten up all jamming handles.

ii. Mounting and dismounting the gun and tripod.—

To mount gun.—

No. 1 removes the elevating and crosshead joint pins. No. 2 opens the sliding shutter and crawls forward with the gun, timing himself to arrive at the position when No. 1 has prepared the tripod as described above. Together they will mount the gun on the tripod. (See Plate 9.) No. 1 will drive in the crosshead joint pin and turn the handle down, he will then swing round, keeping as low as possible and will lie with his legs to the front, right leg

* In obtaining the minimum height, it will be found with most tripods that a firm mounting cannot be obtained by closing the rear leg right up to the socket. It will usually be necessary to adjust the rear leg back one tooth from the socket.

PLATE 9
MOUNTING THE GUN

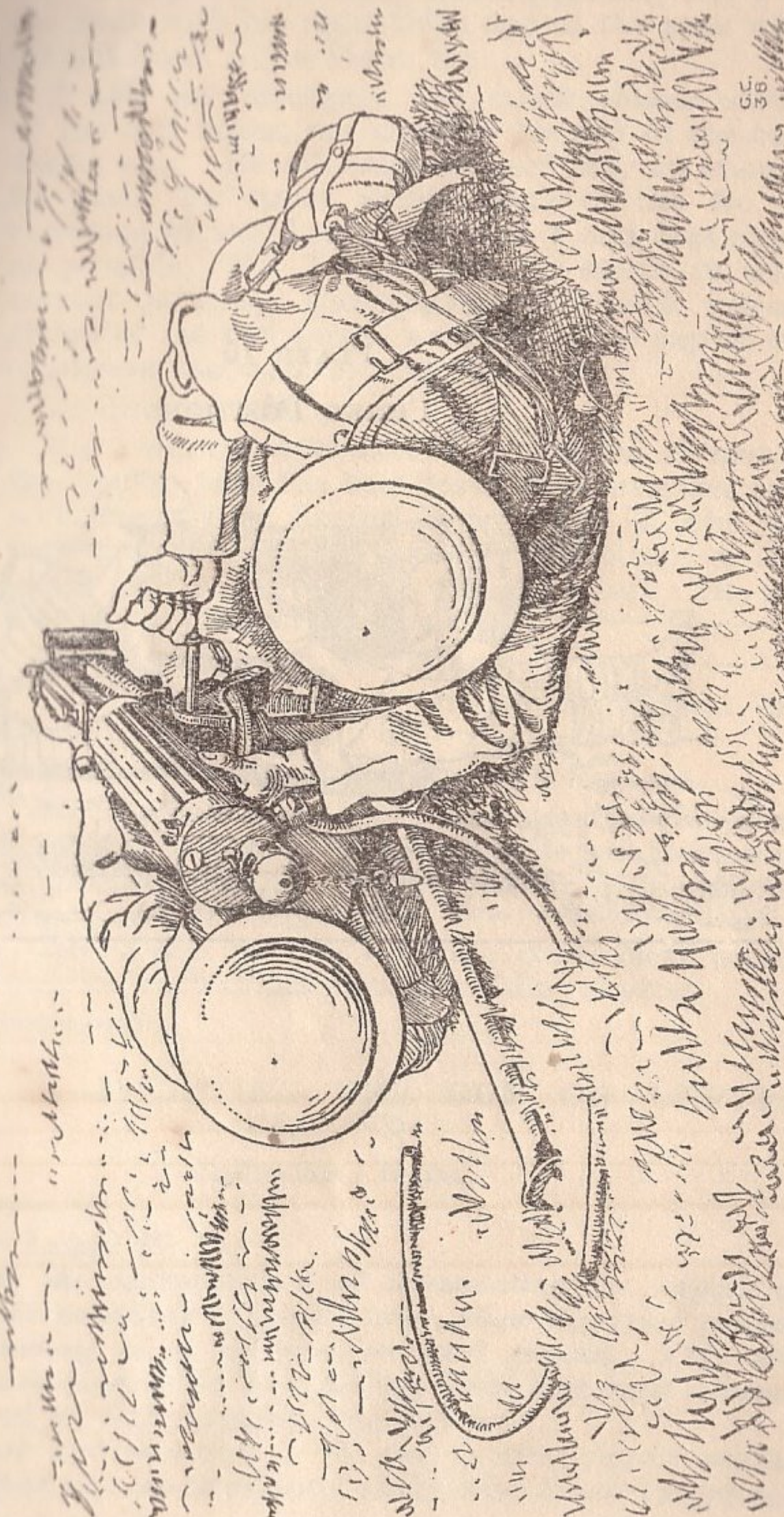
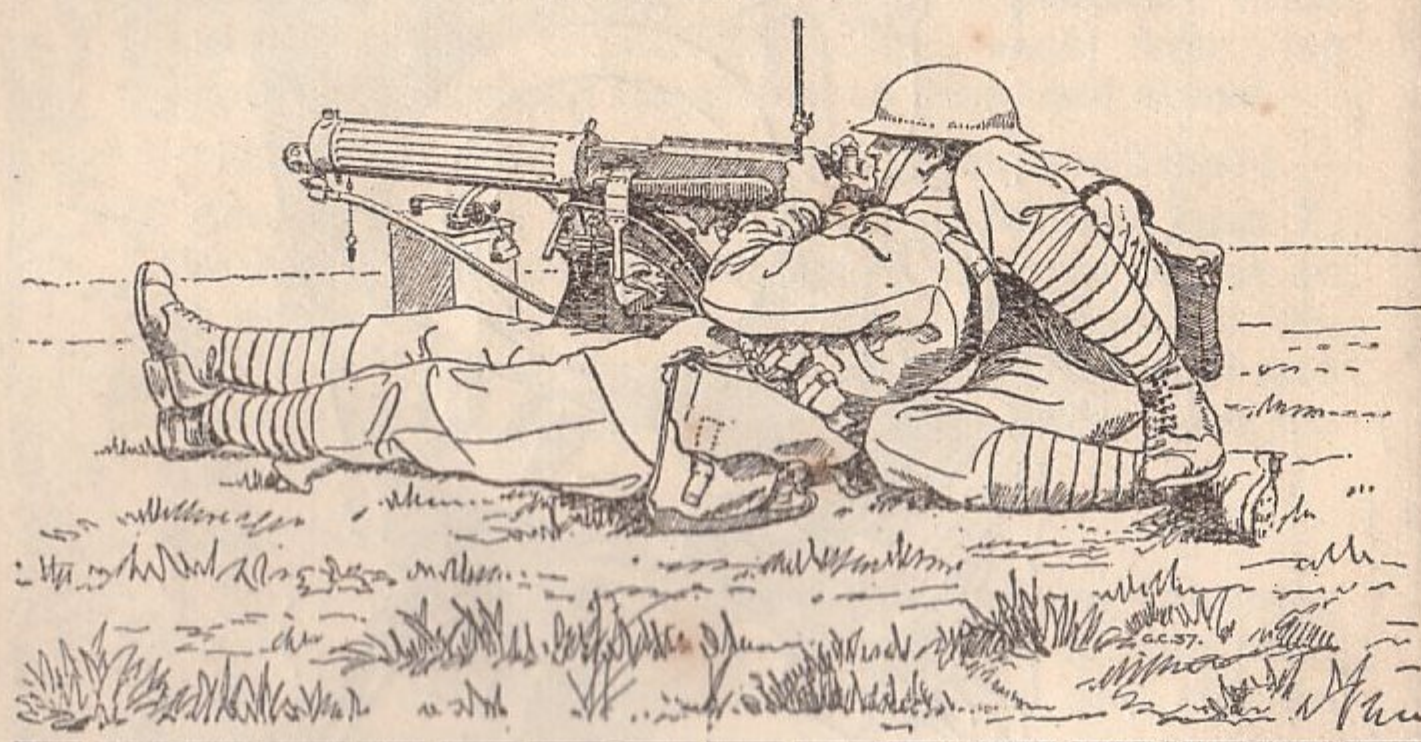


PLATE 10
FIRING POSITION



crossed over the left, his back and neck supported by No. 2. No. 2 will insert the elevating joint pin and then lie on his right side supporting No. 1 in the back with his right thigh and at the neck with his left knee. (See Plate 10.)

No. 3 will not disengage the quick release straps of the belt boxes, nor unscrew the cap of the condenser can. He will crawl forward only far enough to place his stores within reach of the No. 2, screening himself behind the Nos. 1 and 2 as much as possible. No. 2 will place the stores in their correct position, disengaging the quick release straps of the belt boxes, unscrewing the cap of the condenser can, and inserting the tube.

To dismount the gun.—

No. 3 will crawl forward to a position in rear of the gun to take the belt boxes and condenser can, which have been handed back by No. 2, who will first have fastened the quick release straps of belt boxes and the cap of the condenser can. He will then crawl clear of the position.

Nos. 1 and 2 will then either :—

Crawl back, dragging the mounting, and dismount it under cover ; or

They will dismount the gun as follows :—

No. 1 will remove both pins, and after No. 2 has removed the gun, replace them. He will then swing round, keeping as low as possible, dismount the tripod as described above.

No. 2 will remove the gun, crawl clear of the position with it and close the sliding shutter.

3. Practise squad.

LESSON 59.—MOUNTING THE GUN ON UNEVEN GROUND

Instructor's Notes

Stores :—

As for Lesson 57.

During the demonstration of dismounting the tripod, as soon as the mounting is behind cover, allow the squad to view that mounting as it appears on level ground. This will enable them to visualize how the legs could have been adjusted beforehand for that particular gun position.

Explain that movement at the gun position can be avoided if the tripod legs can be adjusted under cover to suit the ground.

1. Types of ground selected should include :—
 - i. The side of a slope for firing in any direction.
 - ii. The top of a narrow bank, with the object of obtaining maximum command.
 - iii. The side of a bank, in order to clear the top or fire along it.
 - iv. A hedgerow, in order to fire through it.
 - v. A shell hole.
 - vi. Broken ground.
2. Explain and demonstrate.—
 - i. Mounting the gun and tripod by moving under cover to a gun position on uneven ground and adjusting all the legs.
 - ii. Dismounting the gun and tripod by dragging the mounting behind cover.
 - iii. Mounting the gun in rear and working forward with it mounted to the selected gun position.
3. Practise squad.

Note.—In examining each mounting the instructor will point out that the following conditions must be fulfilled :—

- i. The mounting must be as low as possible consistent with obtaining a view of the arc of fire or target.
- ii. The position of the rear leg is governed by the shape of the ground, irrespective of the direction in which the gun has to fire.
- iii. The socket must be mounted upright, and over the spot indicated.
- iv. The shoes only, and not the legs must be bearing on the ground.
- v. The ground supporting each shoe must be sufficiently firm to ensure that the shoe does not slip during firing.
- vi. No part of the tripod must interfere with the elevating wheel.

LESSON 60.—BRINGING THE GUN INTO ACTION, AS PART OF A SECTION, MAKING USE OF COVER

Instructor's Notes

Stores :—

As for Lesson 57.

Equipment will be worn.

Explain and demonstrate.—

- i. Explain that the object of this lesson is to practise bringing the gun into action with the minimum

PLATE 11

GUN MOUNTED TO FIRE DOWN A SLOPE

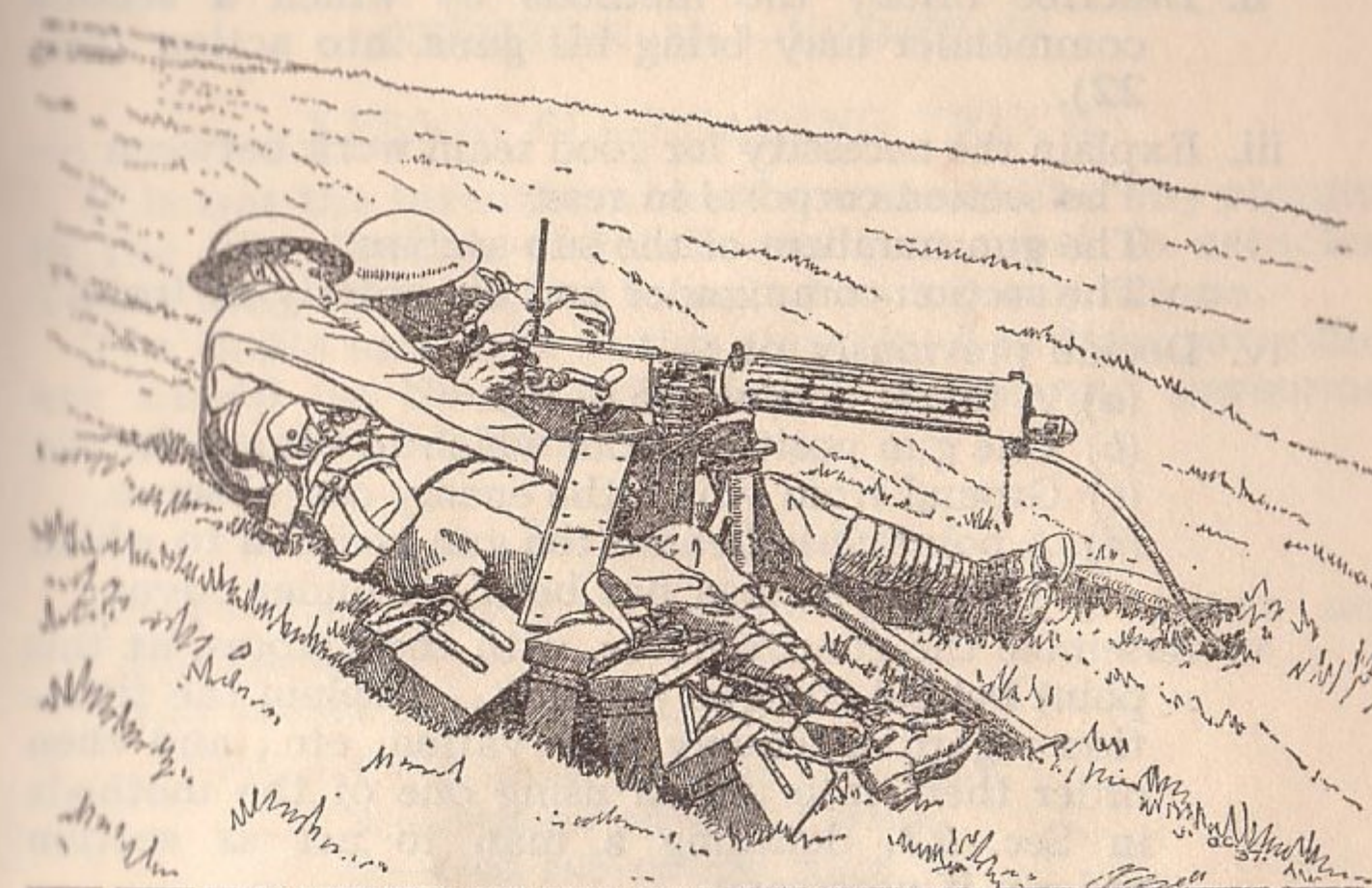
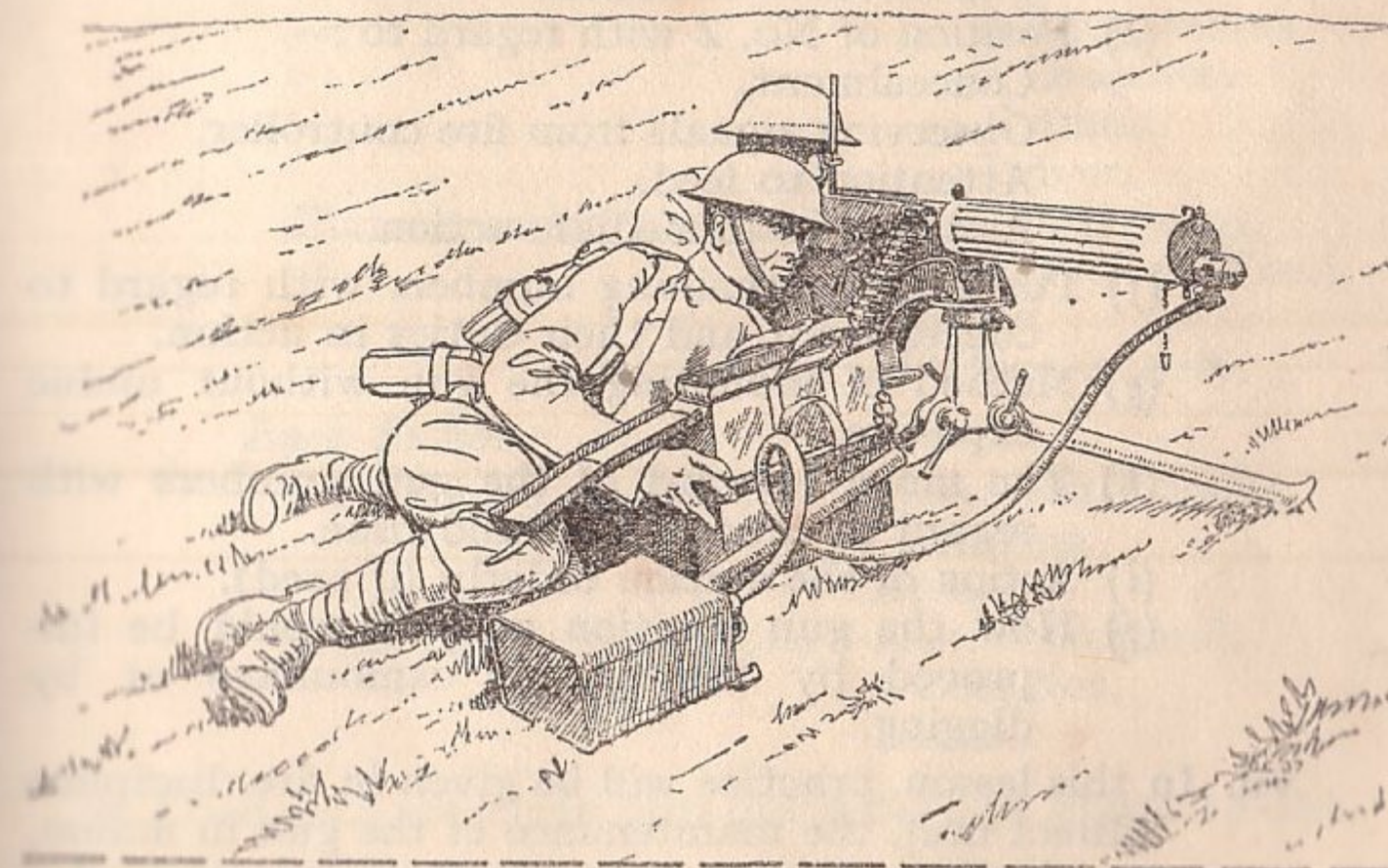


PLATE 12

GUN MOUNTED ON THE SIDE OF A SLOPE



- exposure to enemy observation and maximum cover from fire. The importance of this in training for war will be emphasized.
- ii. Describe briefly the methods by which a section commander may bring his guns into action (Sec. 22).
 - iii. Explain the necessity for good team work between :—
The section corporal in rear.
The gun numbers of the sub-section.
The section commander and his orderly in front.
 - iv. Decide previously on :—
(a) A target and/or arc of fire.
(b) One gun position from which to engage it.
(c) Ground from which the enemy can observe.
(d) A point close behind the gun position to which the sub-section has been led under cover.
 - v. Assemble the gun numbers, with their stores, at this point behind the gun position. Explain the situation regarding enemy observation, etc., and then order them into action using one of the methods in Sec. 22, detailing a man to act as section orderly if necessary.
 - vi. When the gun is in action, discuss the following :—
(a) Ability of the gun to do its task.
(b) Suitability of the mounting.
(c) Position of the stores at the gun.
(d) Position of No. 1 with regard to concealment and freedom of action.
(e) Position of No. 2 with regard to :—
Concealment.
Observing signals from fire controller.
Attention to feed.
Assisting in immediate action.
(f) Position of remaining numbers with regard to concealment and their duties in action.
(g) Method of mounting the gun without undue exposure.
(h) The move forward of the gun numbers with regard to concealment and time.
(i) Action of the section orderly (if used).
(j) How the gun position adopted could be improved by the use of camouflage or by digging.
 - vii. In this lesson, practice will be given in fire discipline (direct fire), the maintenance of the gun in action, and in the complete duties in the occupation of a gun position from the position in readiness (including a long carry).

SECTION 15.—VEHICLES

LESSON 61.—LOADING TRUCKS

It is not the intention that there should be any rigidity in the distribution of loads and personnel to vehicles. These may be modified to suit varying conditions.

The drills and field duties described in this pamphlet are based on the distribution of loads and personnel shown in this Section.

Instructor's Notes

Stores.—Three trucks. Complete stores of 1 section and platoon H. Q.

Lay out the stores in four groups as under :—

Group 1.—Platoon commander's truck.

„ 2.—Platoon serjeant's truck.

„ 3.—Odd sub-section truck.

„ 4.—Even sub-section truck.

1. Explain :—

i. Platoon personnel are distributed as follows :—

Platoon headquarters.

Platoon commander's truck.—Platoon commander.
2 Rangetakers.
2 Orderlies.
Batman.
Driver.

Platoon serjeant's truck.—Platoon serjeant.
2 Scouts (Gun Nos.).
Driver.

Motor cycle.—Platoon orderly.

Each Section.

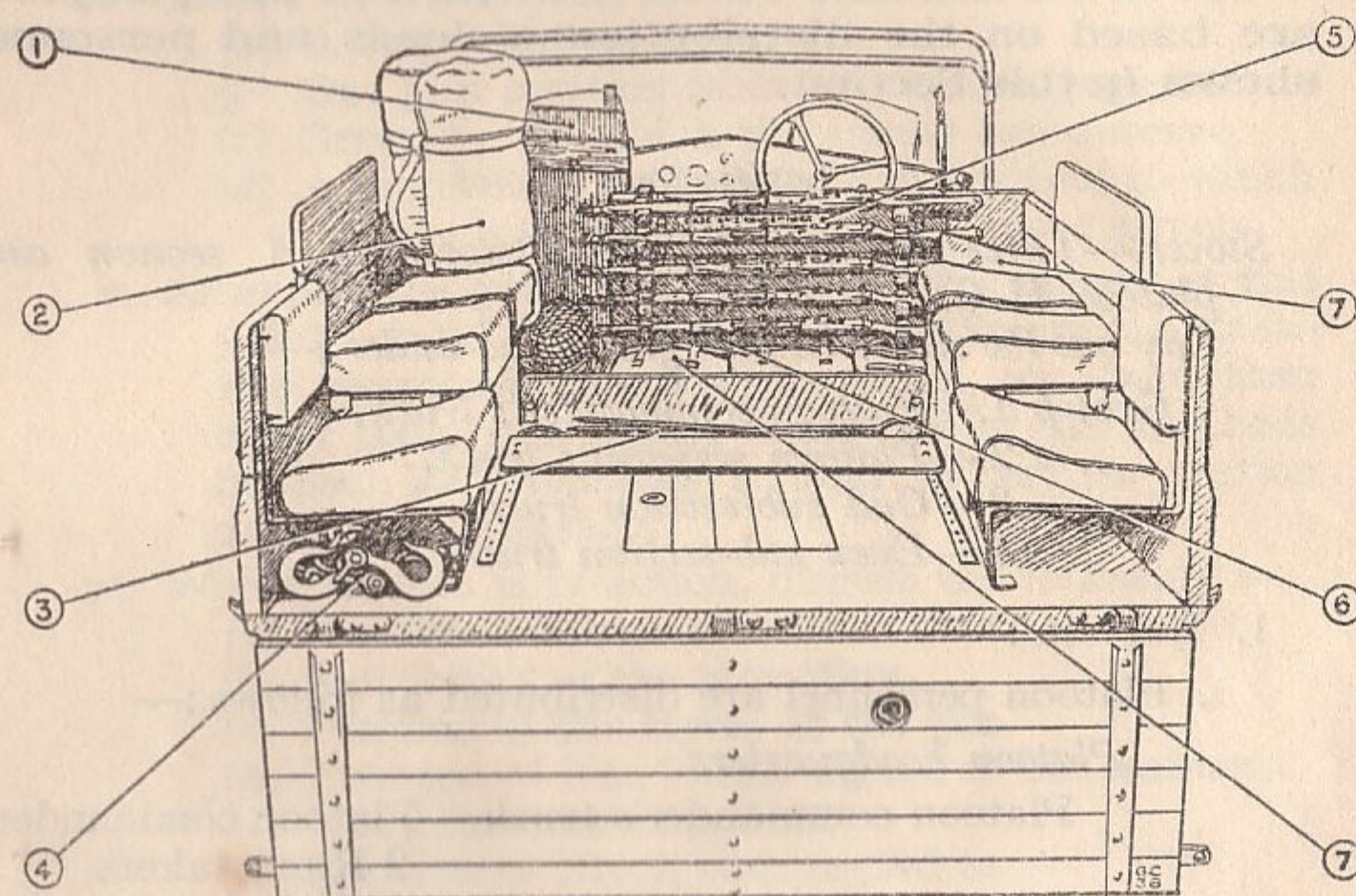
Odd sub-section truck.—Section commander.
4 Gun Nos.
Driver.

Even sub-section truck.—Section corporal.
4 Gun Nos.
Driver.

2. Load each vehicle in turn (for details see Plates 13-18).

3. Practise squad.

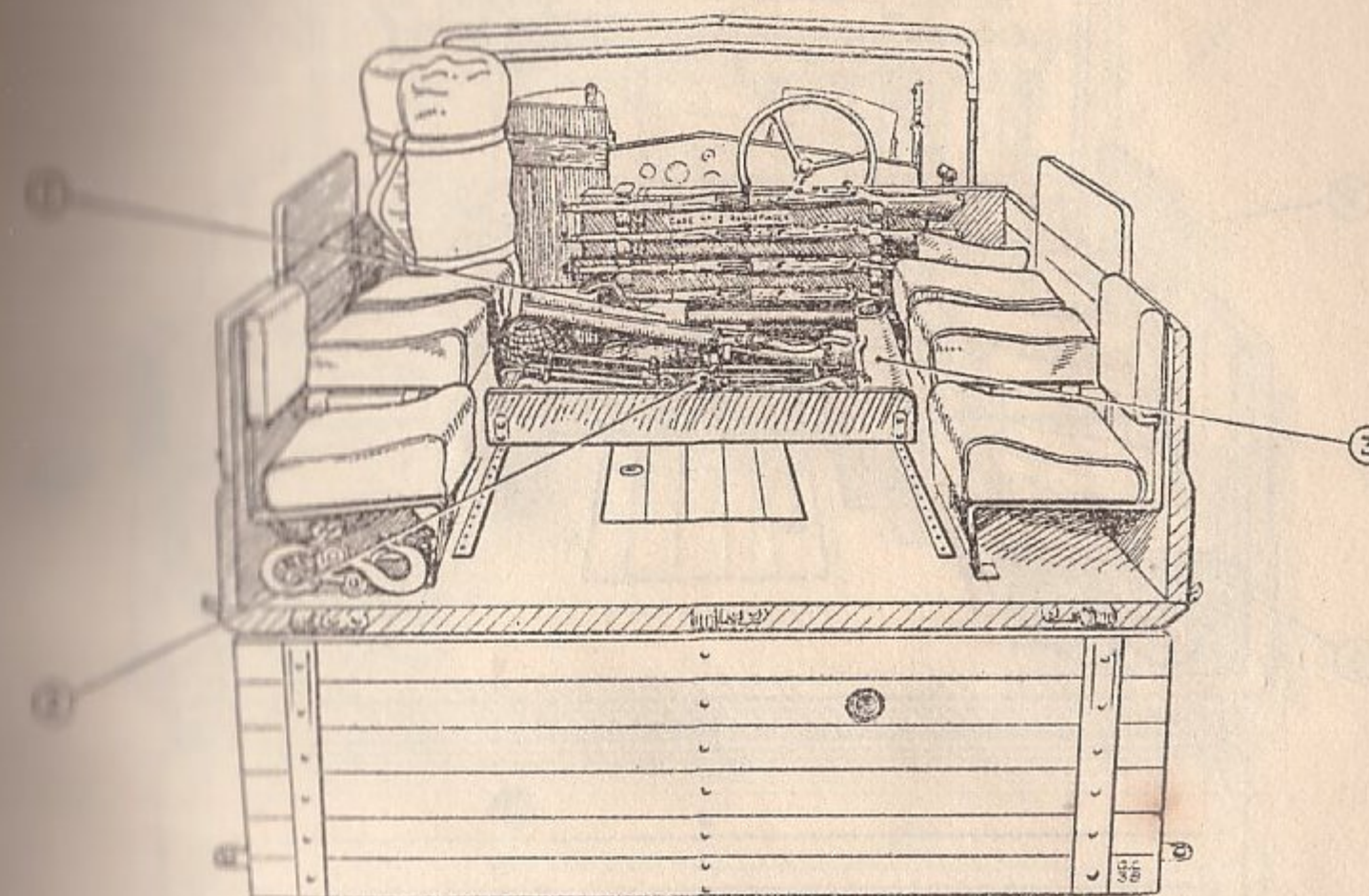
PLATE 13
PLATOON COMMANDER'S TRUCK
(Bottom layer)



KEY

- | | |
|-------------------------------------------------------------------|----------------------------------------------------|
| 1. Drawing board with ruler and drawing sets under rifles. | 5. Rangefinders in cases (2) and 5 rifles in rack. |
| 2. Officers valise with 2 truck nets, and truck cover underneath. | 6. Directors (2). Plotter. Under rifles. Compass. |
| 3. Zero posts (4). | 7. Packs (5). |
| 4. Truck tow wire. | |

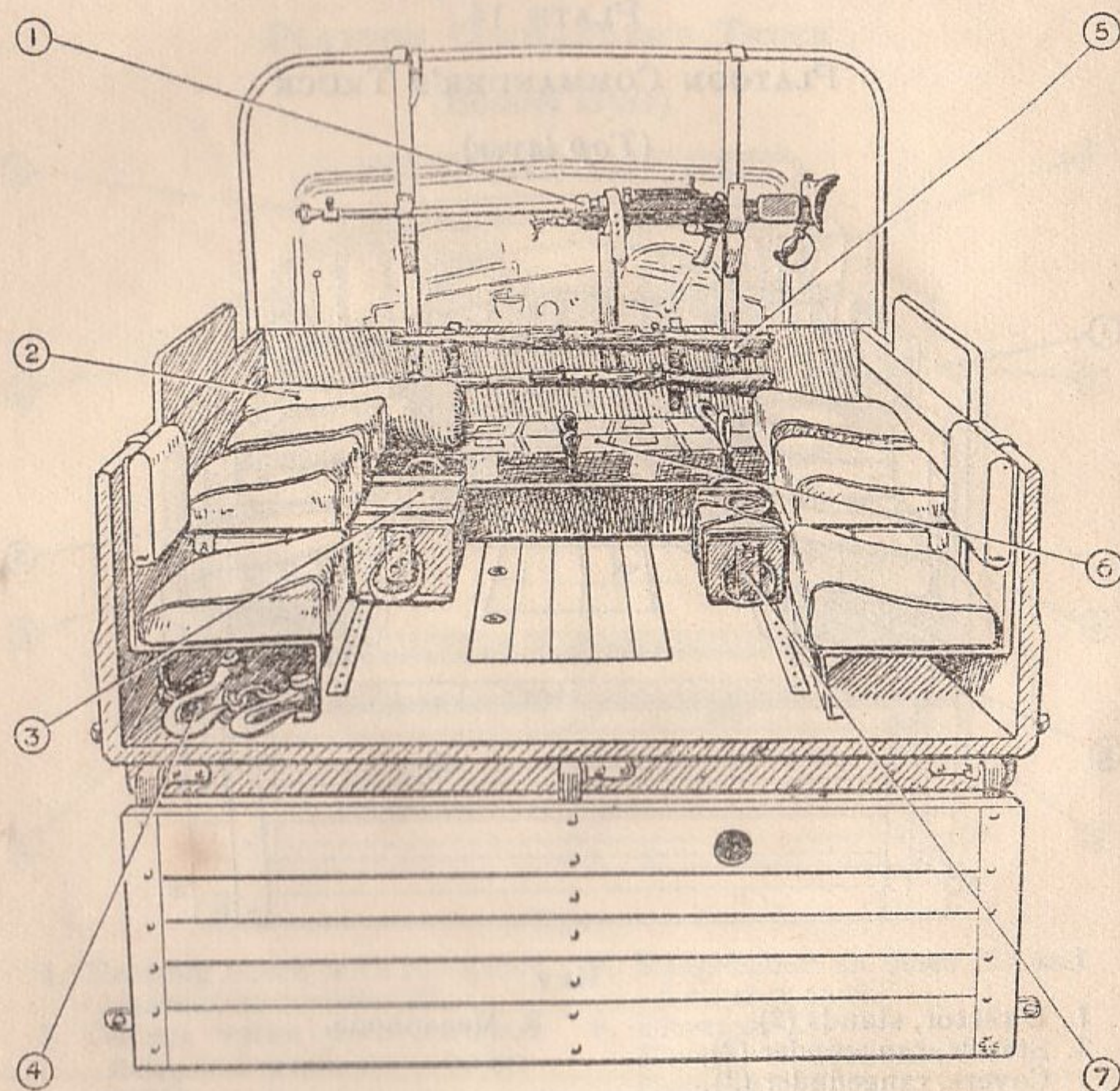
PLATE 14
PLATOON COMMANDER'S TRUCK
(Top layer)



KEY

- | | |
|------------------------------------------------------|---------------|
| 1. Director, stands (2). | 3. Megaphone. |
| 2. Stands, rangefinder (2). Covers, rangefinder (2). | |

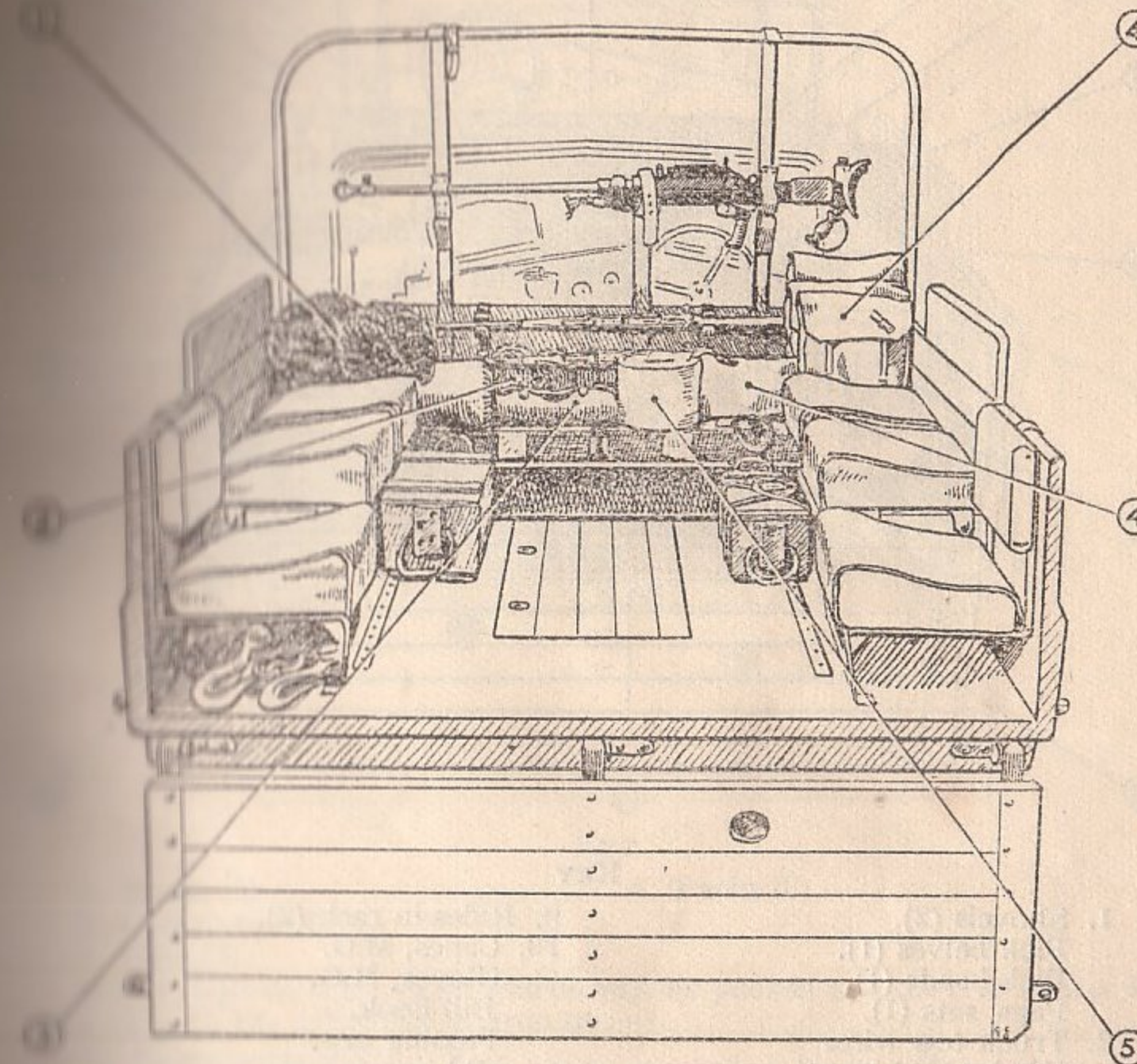
PLATE 15
PLATOON SERJEANT'S TRUCK
(Bottom layer)



KEY

- | | |
|--------------------------|------------------------|
| 1. Anti-tank rifle. | 5. Rifles in rack (2). |
| 2. Truck cover. | 6. S.A.A. boxes (8). |
| 3. Anti-tank rifle ammn. | (Bundle packed.) |
| 4. Truck tow wire. | 7. Hand grenades. |
| | (Boxes 1.) |

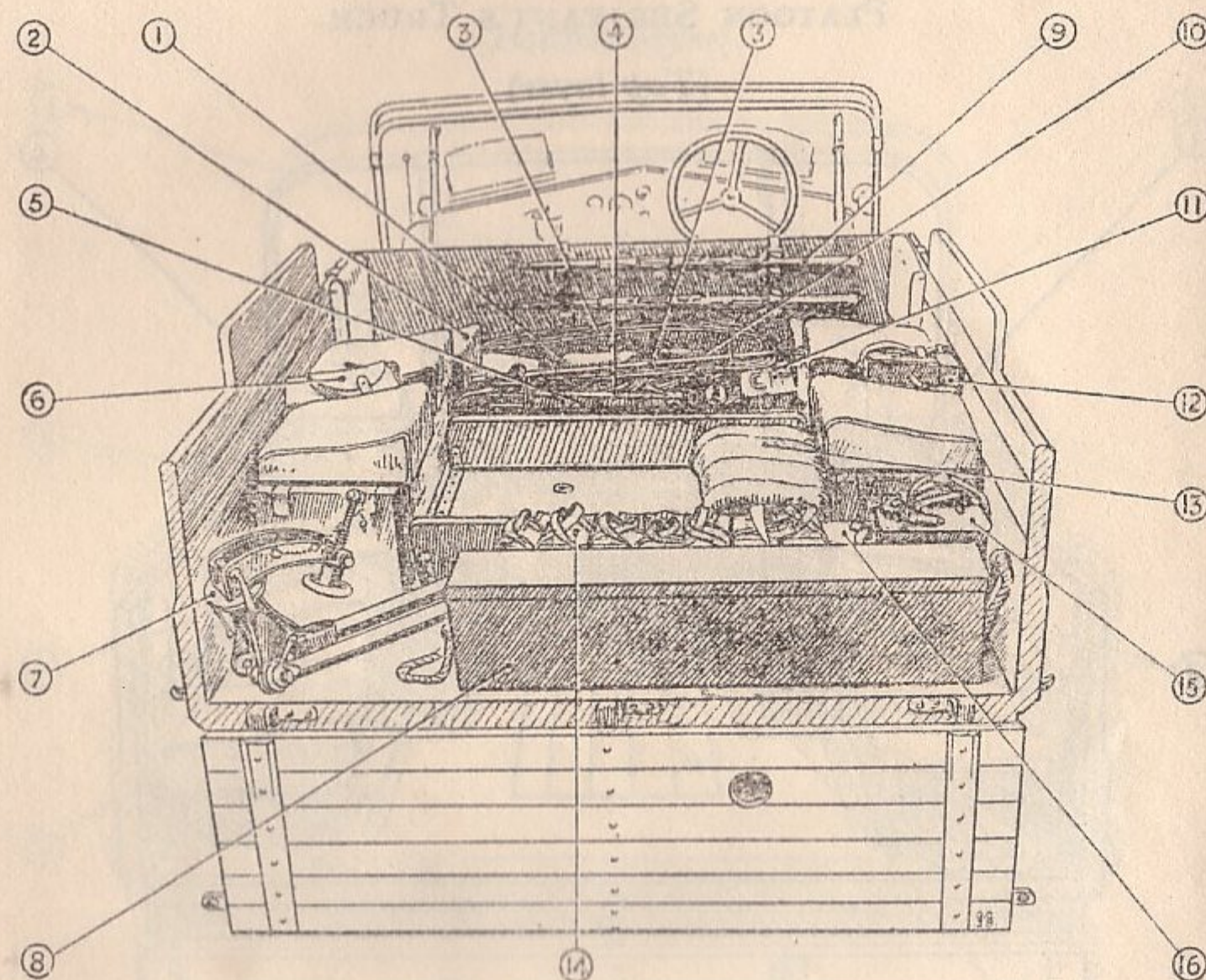
PLATE 16
PLATOON SERJEANT'S TRUCK
(Top layer)



KEY

- | | |
|------------------------|-----------------------------|
| 1. Truck nets (2). | 4. Packs (4). |
| 2. Spare belts (4). | 5. Bleach powder. Tins (1). |
| 3. Cases cans oil (1). | Detector pads (2). |

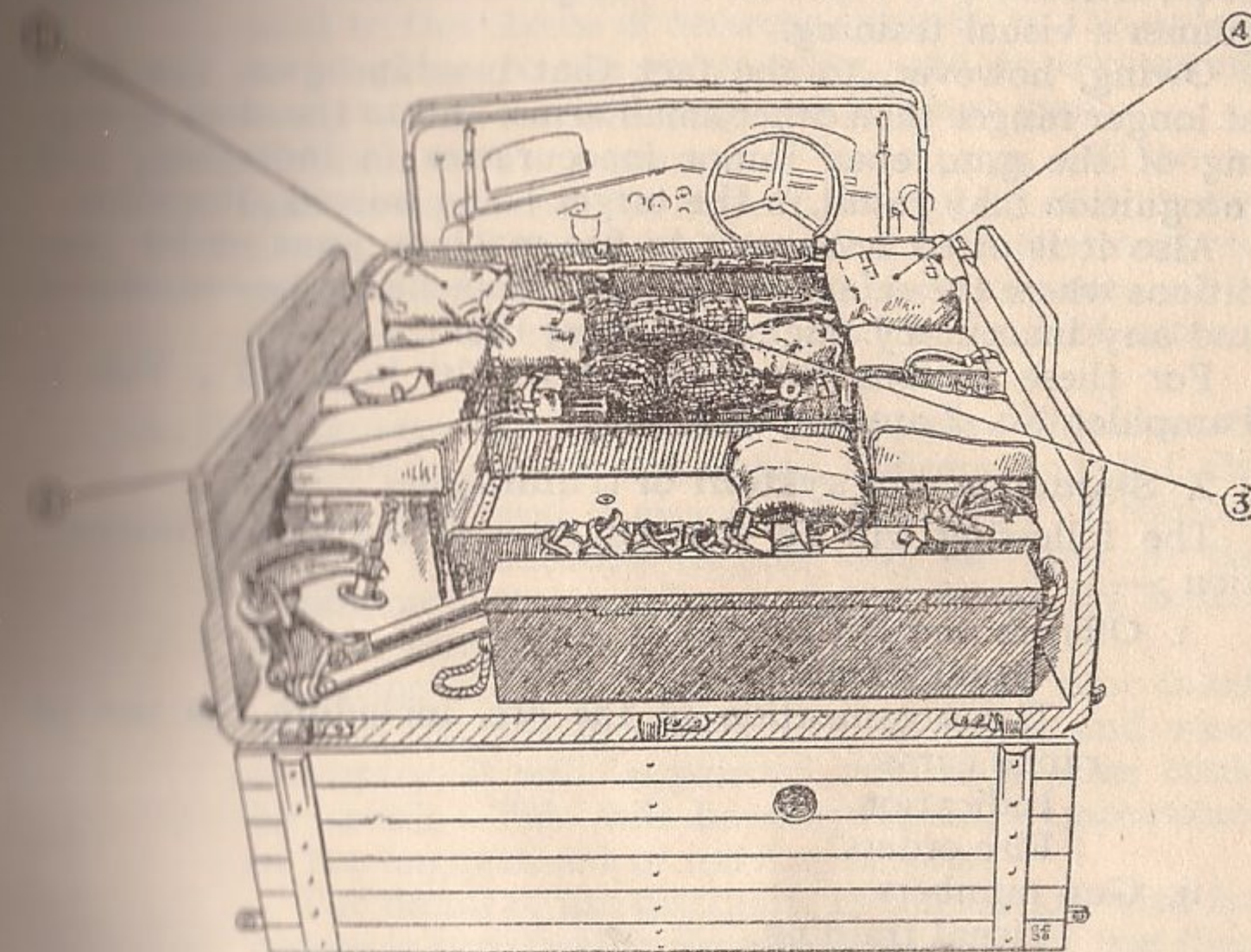
PLATE 17
SUB-SECTION TRUCK
(Odd sub-section, bottom layer)



KEY

- | | |
|------------------------------|------------------------------|
| 1. Shovels (2). | 9. Rifles in rack (2). |
| Pick helves (1). | 10. Capes, M.G. |
| Pick heads (1). | Gloves, M.G. |
| Pegs, sets (1). | Bill hook. |
| 2. Truck tow wire. | Folding saw. |
| (Under seat.) | Old linen. |
| 3. Umbrella (camouflage). | 11. Aiming lamp and torches. |
| Umbrella support. | 12. Dial sight in case. |
| 4. Aiming post. | 13. Truck cover. |
| 5. Belts, S.A.A. (8). | 14. S.A.A. belts (8). |
| 6. Signal pistol and lights. | (1 box between gun chest and |
| 7. Tripod. | condenser.) |
| 8. Gun in chest. | 15. Condenser can and tube. |
| | 16. Spare parts case. |

PLATE 18
SUB-SECTION TRUCK
(Odd sub-section, top layer)



KEY

- | | |
|------------------------|--------------|
| 1. Packs (3). | 4. Packs (3) |
| 2. Cases cans oil (1). | |
| 3. Nets (3). | |

Note 1.—Even sub-section trucks will be packed as shown in Plates 17 and 18 with the following exceptions:—

- | | |
|------------------------|-----------------------------------------------------|
| (i) Spare parts box | } In place of aiming lamp, folding saw and torches. |
| Spare batteries (4). | |
| Tripod pins (4). | |
| (ii) No cases can oil. | |

2. If rifle rack fittings do not exist, rifles of personnel inside the trucks can be held in the hands.

3. On issue of ammunition in factory-filled belts the corresponding amount of ammunition can be carried, but would necessitate an adjustment of loads.

SECTION 16.—VISUAL TRAINING

1. The methods taught in S.A.T., Vol. I, Pamphlet No. 2, 1937, Lessons 1 to 11, must be the groundwork of the machine gunner's visual training.

Owing, however, to the fact that machine guns are fired at longer ranges than other small arms, and to the close grouping of the gun, even minor inaccuracies in indication and recognition may result in the target being missed altogether.

Also it is often necessary to fire machine guns under conditions where the safety of our own troops has to be considered and any inaccuracy might endanger them.

For these reasons the methods taught in S.A.T., Vol. I, Pamphlet No. 2 are amplified here.

2. Sequence and system of training.—

The following will be the sequence of individual instruction :—

i. Officers and N.C.Os.—

Visual training.

The organization of the arc, including the use of range cards.

Indication.

Fire orders.

ii. Gun numbers.

Visual training.

Judging distance up to 1,000 yards.

Recognition.

Application of fire orders.

iii. The range-takers, scouts and orderlies will require instruction in visual training and elementary indication and recognition on the same lines as for officers and N.C.Os.

3. Individual instruction of officers and N.C.Os.—

- i. Visual training.—Attention should be called to those features which are of particular interest to the machine gunner, *e.g.* positions for observation to the front and to the flanks, positions that offer a good field of fire, areas on which observation of fire is likely to be obtained, localities from which enemy attacks may develop, the visibility of skylines, etc. By such practice a necessary introduction will be obtained to the more detailed study

of cover, reconnaissance, and the selection of gun positions.

Practice in the use of glasses should be combined with the above.

- ii. The organization of the arc and use of range cards.—Instruction should be given having regard to a tactical situation. Particular attention should be paid to the choice of reference points, to the orders to be given to the range-taker, and to estimating ranges from the key ranges on a range card.

- iii. Indication.—The sequence of instruction will be as laid down in S.A.T., Vol. I, Pamphlet No. 2, the instructional stores and technical methods involved being adapted to machine gun requirements. For example, directors will be used instead of aiming rests.

- iv. Fire orders.—As soon as a satisfactory standard of indication has been reached, officers and N.C.Os. will be practised in giving out fire orders for various targets. Landscape targets may be used in the preliminary stages. Examples of direct fire orders will be found in Part III, Sec. 24.

During the later stages of training the time taken to give out the fire order will be noted, and when necessary, it will be pointed out where time could be saved. This will be of particular importance in the engagement of moving targets.

The detail of fire discipline in connection with fire orders is practised in Section drill—Direct fire (Sec. 17, Lesson 68).

4. Individual instruction of gun numbers.—

- i. Visual training.—As in S.A.T., Vol. I, Pamphlet No. 2, extended to suit machine gun requirements.

- ii. Judging distance up to 1,000 yards.—The men will be taught to judge distances up to 1,000 yards. The method and sequence of instruction will be as laid down in S.A.T., Vol. I, Pamphlet No. 2.

- iii. Recognition.—Instruction in recognition must only be given by N.C.Os. who have reached a high standard in indication.

The sequence of instruction will be as laid down in S.A.T., Vol. I, Pamphlet No. 2, landscape targets or the miniature range being used in the preliminary stages.

During this instruction the Nos. 1 will be at the guns, and on the conclusion of the indication will be ordered to lay on the point of aim indicated. The instructor will check the point of aim. Not more than four guns should be used at one time by one instructor.

- iv. Fire orders.—As soon as a satisfactory standard of recognition has been reached, the men will be practised individually in the detail of applying fire orders to the gun.

LESSON 62.—INDICATION AND RECOGNITION (WITHOUT AIDS)

Instructor's Note

Stores:—

Gun, tripod, landscape target. The landscape target can be used, but every opportunity should be taken of practising on the ground.

1. **The arc of fire.**—Explain that the area of ground to be watched, and within which targets will be engaged, is known as the arc of fire.

The arc is bounded by the "right of arc" and "left of arc", each limit being an imaginary line passing through the gun position and some easily described point on the landscape in the direction required. Similarly, an imaginary line, known as the "near limit of arc," can be described from right to left across the area to indicate that only the ground beyond this line and within the limits mentioned above need be considered.

2. Demonstrate how, whenever possible, the gun itself will be laid on to the point to be recognized. This is the simplest and most direct method of indication.

Explain how an instrument, for example a director, or "pointer" can also be used.

Explain that the approximate right, centre, or left of arc can be of great assistance to denote a general direction, viz:—

"Right of arc—White house". "Centre of arc—Bright yellow patch".

3. Practise the squad in indication (officers and N.C.Os. only) and recognition by the above means, insisting on an accurate aim every time the gun is laid.

LESSON 63.—INDICATION AND RECOGNITION (WITH AIDS)

Instructor's Notes

Stores:—

Gun, tripod, graticuled glasses, slide rule, degree scale painted on the wall.

Use a landscape target if necessary but preferably practise on the ground.

REFERENCE POINTS

i. Explain that:—

i. Reference points in a machine gun arc may be as far apart as 30 degrees.

In deciding on the number of reference points, the objects to be employed, and their distance apart and from the guns, the fire controller must consider the nature of the arc of fire and his task. As a general rule, as few as possible should be used, so as to avoid confusion.

ii. They should be in the areas where targets may be expected to appear. When the enemy is tied to definite lines of approach, or moving targets are likely, it may be necessary to choose a few reference points close together to facilitate rapid switching.

iii. The points originally used for describing the right or left of arc should not be employed as reference points unless specially named as such.

2. Practise (officers and N.C.Os. only) in the selection of reference points in accordance with the above considerations.

DEGREE MEASUREMENT

3. The squad must first know their own hand angles (S.A.T., Vol. I, Pamphlet No. 2, 1937, Lesson 7).

4. Explain that:—

When it is necessary to give out angles the following form will be followed:—

4°35'—Four degree three five minutes.

12° 5'—One two degrees five minutes.

10°20'—One owe degrees two owe minutes.*

The words "right" or "left" or "elevation" or "depression," will precede the number of degrees or minutes, when required.

In all examples this form of phonetic spelling is used to represent the figures "0".

i. Fire controllers should measure horizontal and vertical angles by means of the graticules in their field glasses or slide rule. If for any other reason it is necessary for them to use hand angles, it should be remembered that they will normally be in the lying position. Therefore, when their individual hand angles are being determined, these should also be checked lying down.

ii. At the gun, degrees included in an indication will normally be measured by hand angles.

iii. If the target is difficult to indicate, the fire controller may order vertical and horizontal angles to be measured by means of the elevating handwheel or gun dial or both.

The following methods may be employed :—

(a) *Using the handwheel only.*—To be employed when there is a prominent mark directly in line with the target, but above or below it.

The section commander orders the range or ranges required to hit the target, and indicates the prominent mark for the guns to lay on.

He then gives the order "**Handwheel**" on which Nos. 1 lay on the mark named.

With his glasses or slide rule, the section commander measures the difference in angle of sight between the prominent mark and the target.

He orders Nos. 1 to elevate or depress the guns by means of the elevating handwheel through this amount.

The order will be given in the form "**All—up (or down) . . . deg. . . . mins.**". He then orders :—

"**Realign sights on . . .**".

Nos. 1 realign their line of sight on the prominent mark by moving the tangent sight slide. The mark is then used as an auxiliary aiming mark.

(b) *Using the dial and handwheel (if required).*—To be employed when there is no mark directly in line with the target.

The section commander chooses a suitable mark as close to the target as possible.

He measures with graticules the horizontal angular amount the target is right or left of the mark, and the vertical amount the target is above or below the horizontal line through the mark.

He gives out the range or ranges to hit the target, indicates the mark and orders "**Dials**".

Nos. 1 adjust their sight to the range and lay on the mark. Nos. 2 set the dials at zero.

The section commander orders :—

"**All—right (or left) . . . deg. . . . mins.**".

"**All—up (or down) . . . deg. . . . mins.**".

The guns are moved through the angles ordered by the use of the dials and elevating handwheel respectively.

The section commander then orders an actual point of aim, e.g. "**patch of brown grass**".

8. The class will practise, officers and N.C.Os. indicating targets by the methods in para. 4 above; the men will only practise recognition by these means, and laying the gun as ordered.

Combination of vertical clock ray and degree measurement will also be practised.

9. Explain that :—

i. The indication of the ends of a target with width requires particular attention.

ii. The insertion of the word "**from**" before the description of one end of the target and "**to**" before the description of the other, will normally suffice to indicate the limits of the targets.

Example :—

"**Centre of arc—bush—from bush to right—five o'clock—three degrees—tree.**"

If the indication is difficult, this may not always be possible, and the words "**from**" and "**to**" would have to be used in the following example :—

"**Centre of arc—house—left, small bush—left, gap in hedgerow—left 7 o'clock—faint dark mark—from bush to mark.**"

In such an indication, to avoid misunderstanding, the words "**right limit**" and "**left limit**" may be used to indicate the flanks. The above example would then be :—

"**Centre of arc—house—left, 9 o'clock—small bush—right limit—left—9 o'clock—gap in hedgerow—left 7 o'clock, faint dark mark—left limit.**"

7. The class will practise as in para. 5 above.

LESSON 64.—DIRECT FIRE ORDERS FOR GUN NUMBERS

Instructor's Note

Stores:—

Two guns, tripods, belts and belt boxes, dummy cartridges, and, if no open country is available, landscape target. Field glasses or slide rule.

1. Explain and demonstrate:—

- i. Point of aim, according to method of fire.
- ii. Overlap at ends of targets and of beaten zones in centre of oblique targets, having a different range to each end.
- iii. Wind allowance and its effect on the point of aim before and during firing.
- iv. Length of bursts, according to the range.
- v. Rate of fire.
- vi. Action of No. 1 on the command “**Stop**”.

2. Take examples of all types of targets, including moving targets, using various methods of indication.

JUDGING DISTANCE TEST

1. The test as laid down in S.A.T., Vol. I, Pamphlet No. 2, 1937, Sec. 3, will be carried out by recruits at their depots.

2. Personnel of M.G. companies will carry out two tests annually.

The instructions for the conduct of tests contained in Pamphlet No. 2, will in general be followed with certain modifications as under:—

i. *Objects.*—All objects will be natural, or where it is impossible, artificial targets such as camouflage screens, etc., may be substituted.

ii. *Distances:—*

(a) Gun numbers will judge on two objects both under 1,000 yards, and not nearer than 600 yards. Also will estimate one range to an object not more than 1,000 yards away and a reasonable distance from a known range.

(b) Subaltern officers, N.C.Os. and selected privates, will carry out the test for gun numbers and in addition will estimate the ranges to two objects not further than 2,000 yards away and within a reasonable distance of two known ranges.

iii. *Standards of efficiency:—*

(a) For judging as in Pamphlet No. 2.

For estimating.—

Up to 1,500 yards permissible error 50 yards.

From 1,500 to 2,000 yards permissible error 100 yards.

NOTE.—Known ranges from which estimations are required will be given to the nearest yard.

The ranges to objects which are to be estimated will be noted to the nearest 50 yards below or above. Those being tested will be given the benefit in assessing their standard of efficiency, e.g. a range of 1387 will be considered as 1350 or 1400 and ranges given as 1300 and 1450 accepted as passing.

(b) In order to pass, gun numbers must be correct within permissible error in two of the ranges; subaltern officers, N.C.Os. and selected privates in four ranges.

(c) Personnel who are tested will either “**qualify**” or “**fail.**” To “**qualify**” it will be necessary to pass **both tests**. An individual who does not attend any test will be graded as “**not exercised**”.

SECTION 17.—SECTION DRILL— DIRECT FIRE

Instructor's Notes

Stores:—

For all periods of section drill, the following stores are required:—

Two guns, two tripods, two condenser cans, two condenser tubes, two spare parts cases, at least ten belt boxes, belts and dummy cartridges.

When additional stores are required, a note to that effect will be found under the heading of each lesson.

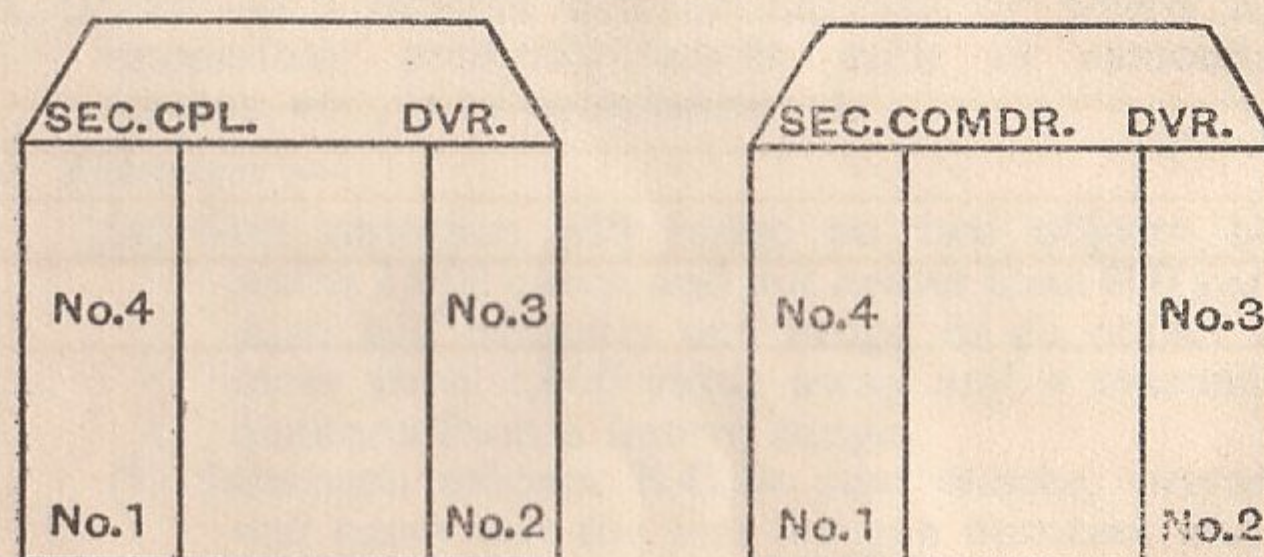
1. Signals and advanced machine gun handling must be taught before proceeding with section drill (see Secs. 13 and 14).

2. As proficiency is attained the drill will be practised introducing cover. This cover can be natural or created artificially with small screens, chairs covered with ground sheets, etc. The direction of enemy observation will be indicated.

3. The object of section drill is to teach and exercise the section personnel in their drill duties as a fire unit employing direct fire.

4. Beginning of drill.—Before the drill begins the instructor will fall the section in, detail a section commander, section corporal, and gun Nos. In addition he will inform the section corporal where the trucks are to be sent when the required stores have been removed and reported correct. (For drill purposes this need only be a short distance in rear.) He then gives the order "Take post" and all ranks will take up their positions in the trucks as shown by diagram.

5. Position of personnel in trucks:—



Note.—For drill purposes trucks should not be less than 20 yards apart.

LESSON 33.—PREPARE FOR ACTION AND COME INTO ACTION

Instructor's Note

Additional stores:—

Two section trucks.

Sec. cpl. (having dismounted) "... belts prepare for action". He moves to a position in front of the trucks and supervises the prepare for action.

Drivers:—

(i). Lower tailboard.

(ii). Assist Nos. 2 to place the gun chests on the ground and open the lids.

(iii). Replace the gun chests and fasten the tailboards and await orders from the sec. cpl.

Nos. 1.—Remove tripods and double forward to positions indicated by the sec. cpl.

Nos. 2:—

(i). Assisted by drivers remove gun chests.

(ii). Take from trucks condenser tubes and spare parts cases, place strap of spare parts case on their right shoulders.

(iii). Remove guns from chests and attach condenser tubes.

(iv). Double forward to a suitable position a few paces to the right of Nos. 1.

Nos. 3.—Take the condenser can and two belt boxes and double forward to a suitable position in rear of Nos. 1 and 2.

Nos. 4.—Remove belt boxes not taken by Nos. 3 up to number ordered, take them forward to Nos. 3, return to a central position in rear and await orders from the sec. cpl.

As soon as stores have been inspected and reported correct to the sec. cpl. he will dispose of the trucks as ordered, warning drivers where to return to when signalled for.

The section commander indicates places where guns are to be mounted and the direction in which they will point.

Section commander.

"Action".

Nos. 1, 2 and 3.—Will mount gun on the spot indicated in accordance with the detail for action in E.G.D. No. 3 making the necessary journeys to place all ammunition at the gun.

Section corporal.—As soon as guns are in action, he positions Nos. 3 and 4 as necessary, himself taking up a position where he can best supervise the work behind the gun position.

LESSON 66.—CEASE FIRING AND ON TRUCKS

Instructor's Note

Additional stores :—

Two section trucks.

Sec. comd. signals trucks. When sec. cpl. acknowledges, sec. comd. orders "**Cease firing**".

(If aiming post has been put out, the sec. comd. must first give the orders "**Unload**" "**Clear guns**".)

Sec. comd.—"Cease firing."

Drivers.—

(i). Drive their trucks to the position previously ordered and lower tailboards.

(ii). Place gun chests on ground and open lids.

Nos. 1, 2 and 3.—Will cease firing as in E.G.D. Nos. 3 making as many journeys as necessary to remove the condenser cans and all belt boxes from the gun position. Nos. 3 of the odd sub-section will first bring in the aiming post if in use.

Nos. 4.—Take up a position just in rear of Nos. 3.

Nos. 1.—Replace their tripods in the trucks also dial sights if in use.

Nos. 2.—

(i). Return to trucks and remove condenser tubes.

(ii). Replace guns, fasten chests, and assisted by drivers put chests on trucks.

(iii). Return condenser tubes, spare parts cases to their correct positions.

Nos. 3.—Return condenser cans and as many belt boxes as they can carry, to their correct positions. No. 3 of the odd sub-section returning aiming post if in use.

Nos. 4.—Return all belt boxes left behind by Nos. 3. No. 4 of the odd sub-section will return the aiming lamp if in use, on his first journey.

Drivers.—Assisted by Nos. 2 replace gun chests, and when all Nos. are on the trucks, fasten the tailboards.

NOTE.—On completion of their duties all Nos. will resume their positions in the trucks. The sec. comd. and sec. cpl. will supervise the action at their own trucks.

LESSON 67.—LONG CARRY.

Instructor's Notes

Additional stores :—

Extra belt boxes.

When the gun position is an appreciable distance from the position in readiness, the section corporal will detail loads equally throughout the section. Nos. 4 returning for any belt boxes which cannot be carried in the first journey. At the end of the carry all belt boxes will be placed with No. 3.

LESSON 68.—FIRE DISCIPLINE

Instructor's Notes

Additional stores :—

Landscape target, if necessary.

Before carrying out this stage of the drill the man must have had sufficient instruction in receiving fire orders.

The instructor will detail an arc of fire and reference points. When a satisfactory standard has been reached, the section should be exercised with the fire controller on the right of or between guns.

Practice of fire orders in all forms, including the allowance for side wind, is an essential part of this drill, particular attention being paid to all points of fire discipline.

LESSON 69.—THE REPLACEMENT OF BREAKAGES

Instructor's Note

Additional stores :—

Spare parts box.

1. Where the spare required is carried in the spare parts case.

No. 2 replaces the broken part from the spare parts case. If the lock is broken and is repairable he will hand it with the wallet to No. 3.

No. 3 will carry out the necessary repair and return the lock and wallet to No. 2 at the first opportunity. In all cases the broken part will be retained.

2. Where the spare part required is not in the spare parts case.

The part is called for. No. 4 takes it from the truck and passes it forward through No. 3 to No. 2. The broken part is returned to the truck.

NOTE.—The section corporal is responsible that broken parts are replaced immediately the situation allows.

LESSON 70.—TO CONTINUE FIRING IN THE EVENT OF THE TARGET BECOMING OBSCURED

Instructor's Note

Additional stores:—

Two dial sights. One aiming post.

1. When the target is likely to be obscured for a short time only:—

Section commander.—

“Pick up gun aiming marks”.

No. 1 picks up a gun aiming mark.

No. 2 sets the direction dial at zero. He looks over the sights and memorizes the aiming mark, its position and the setting of the tangent slide.

2. When the target is likely to be obscured for some time.

Section commander orders gun aiming marks to be picked up as above.

He then orders.—

“Indirect fire equipment”.

No. 3 passes order back to No. 4.

Nos. 4 remove dial sights and one aiming post from the trucks, hand them to No. 4 of the odd sub-section who takes them to Nos. 3, handing the aiming post to No. 3 of the odd subsection.

At the first opportunity the section commander orders.—

“Check elevation”.

Nos. 3 hand the dial sights to Nos. 1.

Nos. 1 attach the dial sights to the gun and checks to see that the dial and deflection drums are at zero. They then relay on the gun aiming mark using the tangent sight. The tangent sight will then be lowered. No. 2 checks to see that the direction dial on the tripod is set at zero.

Nos. 1 set the range being used to engage the target on the range drum, and then levels the bubble by means of the angle of sight drum.

Section commander.—

“Unload”—**“Clear guns”**.

No. 1 unloads and clears gun as in E.G.D.

Section commander.—

“Out aiming post”.

No. 1 closes rear cover.

No. 3 puts out the aiming post centrally about 15 yards in front of the guns.

Nos. 1 align the collimators on the aiming post.

Section commander.—

“Load”—**“Fire”**.

LESSON 71.—TO MAKE PREPARATION IN DAYLIGHT TO CONTINUE FIRING IN DARKNESS

Instructor's Note

Additional stores:—

Two dial sights. One aiming post, two torches, one aiming lamp.

Section commander.—

Sends for the section corporal, No. 4 of the odd subsection, and any night firing stores which are not already at the gun position. They move to a position in the centre and slightly in rear of the Nos. 3.

Section commander.—

“Prepare for night firing”.

Section commander takes post at No. 1 gun, the section corporal at No. 2 gun.

DIRECT FIRE

Nos. 1 relay on the target, and lower the tangent sights.

Nos. 2 set the dial on the tripod at zero.

No. 4 of the odd subsection brings up the night firing stores, and hands:—

1 torch each to the section commander and the section corporal, the dial sights to Nos. 3, and the aiming lamp and the aiming post to the No. 3 of the odd subsection. Nos. 3 hand the dial sights to Nos. 1.

Nos. 1 place the dial sight on the guns, ensure that it is set at zero, set the range (from the tangent sight) on the range drum, and then level the bubble by means of the angle of sight drum.

Section commander.

“Unload ”—“Clear guns ”—“Out aiming lamp ”.

Nos. 1 close rear covers. No. 3 of the odd subsection will put out the aiming post centrally in front of the two guns, place on the aiming lamp, secure the box, attach the line to the switch, and bring the reel back to the section commander.

Nos. 1.—Align the collimator on the lamp.

Section commander orders.—

“Load ” and “Fire ” as required.

INDIRECT FIRE

Nos. 1 relay on the aiming post, and after No. 3 has attached the lamp, etc., as for direct fire, Nos. 1 align the collimator on the aiming lamp.

LESSON 72.—TO CHANGE FROM NIGHT FIRING TO DIRECT FIRE*Instructor's Note*

Additional stores:—

Two dial sights, one aiming post, two torches, one aiming lamp.

Section commander.—

“Prepare for direct fire ” “Unload ” “Clear guns ” “In aiming lamp ”.

Nos. 1 remove the dial sights.

No. 3 of the odd subsection moves out, replaces the lamp in the box, and brings in box and aiming post. He collects the reel from the section commander and rewinds the line, replacing it in the box. He collects the torches from the section commander and section corporal and the dial sights from Nos. 1, and replaces them with the aiming lamp and aiming post, in a place of safety, until an opportunity occurs for them to be returned to the trucks.

NOTE.—To change from night firing to indirect fire.—

Nos. 1 check their aim on the aiming lamp.

No. 3 of the odd subsection acts as for direct fire, except that the aiming post is left out.

Nos. 1 realign collimator on the aiming post.

SECTION 18.—PLATOON DRILL—INDIRECT*Instructor's Notes*

1. *Signals.* The required signals must be taught before proceeding with platoon drill, indirect (see Sec. 13).

2. *As proficiency is attained, the drill will be practised, making use of cover as in section drill direct fire.*

3. *Stores required.* Each section as for section drill, direct fire plus two dial sights and aiming posts.

4. *The object of platoon drill, indirect, is to teach and exercise the platoon personnel in their drill duties as a fire unit employing indirect fire.*

5. *Beginning of drill.* Before the drill begins the instructor will fall the platoon in, detail off sections as in section drill direct fire. Before the order “Take Post” the instructor will inform the senior section corporal where the trucks are to be sent when the required stores have been removed and reported correct. (For drill purposes this need only be a short distance in rear.)

LESSON 73.—PREPARE FOR ACTION*Instructor's Note*

Additional stores:—

Four section trucks and a megaphone.

On the order **“Take post ”** the senior section commander will double forward to the gun position, placing himself on that flank which will be nearest to the platoon O.P. from which position he is responsible for the general duties on the gun position.

Junior section commander.—

“ . . . belts—for indirect fire—prepare for action.”

The junior section commander will position himself midway and in front of the platoon, and supervise in general the prepare for action. Both section corporals supervising the work at their own trucks, finally joining their Nos. 4.

The action of each section will be as in section drill, direct fire. In addition to their previous duties, Nos. 1 will first remove dial sights, placing the strap over their right shoulders.

Nos. 3 of the odd subsections, removes the aiming post.

Subsections will be positioned by the junior section commander. When the stores have been removed from the trucks and have been inspected and reported correct the senior section corporal will :—

1. Send Nos. 4 to join the trucks.
2. Send the trucks to the position ordered.
3. Place himself and the junior section corporal in the most suitable position from which they can supervise in the communication between guns and trucks.

If a long carry is necessary, the same procedure as in section drill direct fire will be adopted, except that the junior section commander will detail loads.

LESSON 74.—TO COME INTO ACTION

Senior section commander orders forward junior section commander and gives the following orders :—

Method of paralleling (position of director, if necessary) pivot gun, if any, gun position, frontage and direction.

Senior section commander.—

“ Junior section commander ”.

Junior section commander doubles forward and receives orders as above, from the senior section commander, doubles away to the opposite flank of the gun position, kneels down, and faces inwards.

Senior section commander.—

“ For indirect fire—mount gun ”.

Both section commanders will supervise the arrival of Nos. 1 of the nearest section, ensuring that the inner gun is the correct distance from him and staggered.

Nos. 1.—Double forward, mount their tripods on the positions as directed by the section commander. They stamp in the shoes of their tripods before sitting down, when the gun is mounted, will affix the dial sight.

Nos. 2.—Having mounted their guns, will take post as for direct fire.

Nos. 3.—Carry out their duties as in section drill, direct fire, finally taking up a position a short distance in rear of their guns.

Nos. 3 of the odd subsections put out the aiming posts centrally between the two guns of their section.

LESSON 75.—CEASE FIRING AND ON TRUCKS

Instructor's Notes

Additional stores :—

Four section trucks, one megaphone.

When this heading is being taught immediately after “ To come into action ” it will first be necessary to have guns loaded in order that cease firing may be carried out correctly.

Fire controller signals.—

“ Cease firing ”.

Senior section commander acknowledges the signal. He then signals for “ Trucks ”.

Senior section commander.—“ Unload—Clear guns ”
—“ Cease firing ”.

The movement will be carried out as in section drill direct fire, with the addition that Nos. 1 will remove their dial sights before the guns are dismounted.

Senior section commander.—

“ On trucks ”.

Each section will act as in “ On trucks ” in section drill direct fire.

To parallel the guns.

Section commanders will acknowledge all verbal orders by raising their hand, they repeat orders when necessary, and keep their hand raised if a repetition is required.

The guns are paralleled by one of the methods described in Part III, Sec. 25.

LESSON 76.—DIRECTOR METHOD

Instructor's Notes

Additional stores :—

One director.

This method should be practised, using the director in different positions in relation to the guns.

Junior section commander.—On designation of the first gun to receive its zero line, he will take up a position behind that gun. As each gun receives its zero line he will repeat the angle to the fire controller. He will then proceed along and in rear of the guns, checking each gun in turn for parallelism.

To do this he will stand behind the guns and glance along each barrel casing in turn. If there is a distant crest in front of the guns, the lines of fire of the four guns should be on approximately the same point. If no distant crest is available he will see where the line of fire of one gun crosses the crest in front and make own approximation from this as to where the others should cross right or left of it. He will report immediately to the senior section commander should any gun not appear to be parallel.

Fire controller.—

“Zero lines”.

No. 1.—Right (or Left)...degrees...minutes.

No. 2. ” ” ”

No. 3. ” ” ”

No. 4. ” ” ”

Nos. 1 will place the angle ordered, on the dial and deflection drums, and lay on the director. They will then re-zero the dial and deflection drums.

Nos. 2 will set the tripod dial at zero.

LESSON 77.—POST METHOD

Instructor's Note

Additional stores :—

Two zero posts.

The senior section commander marks the position (with reference to the posts) over which the pivot gun will be mounted.

On the order **“For indirect fire—mount gun”** the Nos. 1 and 2 of the pivot gun, align the gun on the posts, moving the tripod right or left until the line of sight through the collimator is in exact alignment of the posts. When this has been checked by the senior section commander Nos. 1 and 2 stamp in the tripod, the senior section commander rechecks the line of sight and ensures that the dial and deflection drums are set at zero.

Senior section commander.—Lays the dial sight at the collimator of each gun in turn, reading the angle from the front pointer of the dial and deflection drum.

Junior section commander.—Takes up his position behind the gun farthest from the pivot gun, repeats the angle to the senior section commander, and checks for parallelism as in director method.

Senior section commander.—

“Zero lines”.

No. —Right (or Left)...degrees...minutes.

No. ” ” ”

No. ” ” ”

Nos. 1 on receipt of the angle, set that angle on the dial sight and lay on the collimator of the pivot gun. When laid they will reset the dial sight at zero. No. 1 of the pivot gun will be ordered to re-zero his dial sight.

The senior section commander checks the aim and dial (closing the angle).

Nos. 2.—Will set the tripod dial at zero.

Senior section commander.—reports to fire controller—

“Guns on zero lines”.

No. 3 of the pivot gun doubles forward and brings in the fire controller's posts.

LESSON 78.—COMBINATION OF DISTANT AIMING POINT AND POSTS (OR TARGET)

Instructor's Note

Additional stores :—

Two zero posts and one director.

Senior section commander.—Selects the D.A.P. and with a director measures the angle D.A.P.—Posts (or target). The “Junior section commander” doubles forward and receives orders including D.A.P. which the senior section commander will indicate by director. He then takes up his position as in director method.

Senior section commander.—

“For indirect fire—mount gun”.

Guns are mounted as for director method. The pivot gun being mounted over the spot from which the senior section commander measured the angle D.A.P.—Posts (or target).

Senior section commander.—

“Zero lines”—“All right (or left)...degrees...minutes”.

Nos. 1 will set their dial sights at the angle ordered.

Both section commanders will lay the collimator of each gun of their section on the D.A.P.

Nos. 1 will zero the dial sight.

Nos. 2 set the tripod dial at zero.

Junior section commander—repeats the angle. Checks the line of all guns for parallelism.

Senior section commander—reports to fire controller—
“Guns on zero lines”.

No. 3 of the pivot gun doubles forward and brings in the fire controller's posts, if put out.

LESSON 79.—T.O.G. METHOD

Instructor's Notes

Additional stores :—

Four zero posts and a director.

Pivot gun as for post method, except that the gun is laid on the director. The guns are then paralleled as in D.A.P. or post method.

Senior section commander.—

“Out zero posts”.

Nos. 3.—Put out the zero posts as directed by Nos. 1.

Senior section commander—reports to fire controller
“Guns on zero lines”.

LESSON 80.—TO PLACE THE NECESSARY ELEVATION ON THE GUN

Fire controller.—

“No. ... (or all) ... Hundred (or Fifty). ... Plus (or Minus) ... degrees ... minutes.”

or

Elevation (or depression) No. . . . (or all) degrees . . . min.

Nos. 1 act as taught in use of instruments.

To check crest clearance.

i. *Near crest.*—

When the gun has been laid for elevation (or depression) Nos. 1 set their tangent sights at 400 yards, and see that the line of sight over the gun foresight clears the crest. If it does not, they report to the section commander “No. ... gun does not clear crest”.

ii. *Distant crest.*—

Senior section commander.—

“Check for crest clearance with sights at ...”.
(For method of obtaining this range see Sec. 25, Lesson 115).

No. 1.—Sets the tangent sight at the graduation ordered and proceeds as in (i), above.

Nos. 1 test the clamp, and finally relay on the aiming posts.

Senior section commander—reports to fire controller
“Guns ready to load”; and also reporting any gun which will not clear crest.

Fire controller.—

“Load”.

LESSON 81.—DISTRIBUTION AND CORRECTIONS

Fire controller.—

“Distribution”.

No. Nil.

No. —Right (or left) ... degrees ... minutes.

No. " " "
No. " " "

Nos. 1. Set the deflection drum to the angle ordered, tap the gun across until the collimator, is on the aiming post. (He ensures that the bubble is central using the handwheel. If not, he will centralize it and realign the collimator on to the aiming post.)

To tap right and left.

Fire controller.—

“Right and left ... taps”.

After this order has been received, Nos. 2 indicate guns ready to fire. When all guns are ready, section commanders indicate to fire controller.

The right section will tap first to the left, and the left section will tap first to the right, by the amount ordered.

To make allowance for side winds.

Fire controller.—

“Wind right (or left) ... degrees ... minutes”.

Nos. 1 make the necessary adjustment on the deflection drum, and tap their guns over until the lines of sight are on the aiming posts.

Nos. 2 act as in section drill, direct fire.

As soon as guns are relaid Nos. 2 and section commanders will indicate guns ready to fire.

Fire controller, signals or orders.—

“Fire”.

Section commanders and Nos. 2 lower their hands.

Nos. 2 ordering fire if necessary.

Nos. 1 fire.

Fire controller signals.—

“Stop”.

Section commanders—repeat.

Nos. 2 repeat “Stop.”

Nos. 1 stop.

Corrections during firing.

NOTE.—Any corrections during firing, signalled by the fire controller, must first be repeated by the senior section commander, before being given verbally to the guns.

i. **Direction.**—

Fire controller.—

“Stop” “All right (or left) ... degrees ... minutes”.

“Go on”.

Nos. 1 act as taught in controlled corrections indirect, E.G.D.

ii. **Elevation.**—

Fire controller.—

“Stop” — “All up (or down) . . . Hundred (or Fifty)” “Go on”.

or

“Stop” — “All up (or down) . . . min” “Go on”.

Nos. 1 act as taught in “controlled corrections—indirect” (if the correction ordered is down, they will re-check for crest clearance).

LESSON 82.—TO ENGAGE A NEW TARGET

Fire controller.—

“Stop. All on zero lines”.

Nos. 1 set their dials and deflection drums at zero and relay on the aiming posts.

Nos. 2 check the tripod dial to see that it is at zero.

Fire controller.—

“All ... right (or left) ... degrees ... minutes.”

Nos. 1 set their dial sights to the angle ordered and relay on the aiming posts.

Fire controller—Orders elevation as in Lesson 80.

Nos. 1 perform their duties as in Lesson 80.

LESSON 83.—FIRE CONTROL CHARTS

Instructor's Note

Additional stores:—

Four fire control charts, four watches.

This drill is based on the assumption that all N.C.Os. have been informed that the fire will be controlled by fire control chart.

The guns are placed on zero lines by any method previously taught.

When guns are paralleled the fire controller calls for section commanders and section corporals, and issues the fire control charts.

Section commanders and section corporals take post at their guns.

Fire controller.—

“Load”.

“Prepare for Task 1”.

The N.C.O. at each gun will issue orders to the No. 1 in accordance with the detail on his chart. When their guns are ready to fire, they report to the senior section commander, who in turn reports to the fire controller “Guns ready to fire”.

Fire controller.—

“Fire”.

The N.C.O. in charge of each gun will control the rate of fire and lifts, etc., as shown on his chart. He will also order “Stop” at the end of each task.

Where time is allotted for points during firing on the fire control charts, the N.C.O. must see that this time is not exceeded.

SECTION 19.—SECTION DRILL—NIGHT FIRING

Instructor's Notes

Stores:—

Two guns, two tripods, two spare parts cases, two condenser cans, two condenser tubes, two dial sights, one aiming lamp, one aiming post at least, ten belt boxes, belts and dummy cartridges.

Both section commander and corporal will be in possession of a torch.

The object of section drill—night firing—is to teach and exercise the section personnel in their drill duties as a fire unit by night.

LESSON 84.—PREPARE FOR ACTION AND COME INTO ACTION

Instructor's Note

Additional stores:—

Two section trucks.

Section corporal.—

“ . . . Belts—For night firing—prepare for action ”.

All duties are the same as for “ For indirect fire—prepare for action ”, except that gun Nos. will remain with their equipment in file in front of the trucks. No. 4 of the odd numbered subsection removes the aiming lamp and aiming post. (Nos. 3 will not remove aiming posts.)

The section corporal is responsible that all the necessary stores have been removed from the trucks. He will then detail loads and move the section forward to a position in rear of the gun pegs.

TO COME INTO ACTION

Instructor's Notes

Additional stores:—

Two gun pegs, two direction pegs, two zero posts.

These pegs and posts should be in position before this drill begins.

The section corporal reports to the section commander, and is shown the gun peg of No. 2 gun, the direction of the rear leg, and the direction of his direction peg and zero post.

Section commander and section corporal.—

“ No. . . . For night firing—Mount gun ”.

Nos. 1 and 2.—Mount their guns as in platoon drill—indirect, approximately over the gun peg.

Nos. 3.—When called for by the N.C.O. at the gun, will carry out their duties as in “ Mount Gun ”, E.G.D., with the exception that No. 3 of the odd subsection remains on the gun position and receives the aiming lamp and aiming post from No. 4.

No. 4 of the odd subsection brings forward the aiming lamp and aiming post and hands them to the No. 3 of the odd subsection after the No. 3 has placed the two belt boxes and the condenser can at the gun position.

LESSON 85.—TO OBTAIN DIRECTION AND ELEVATION

DIRECTION

Section commander informs the section corporal which direction peg he is going to first. Accompanied by the No. 3 of the odd subsection with aiming lamp and aiming post, he will place the lamp as low down as possible behind the direction peg with the peg outlined down the centre of the lamp.

Section commander.—

“ No. . . . Direction ”.

No. 1, assisted by the No. 2, moves the gun until the line of sight through the collimator is aligned through the zero post on to the lamp. If the lamp is some considerable distance from the gun, the section corporal should shine the torch into the front of the collimator.

Section corporal checks the aim, sees that the dial and deflection drums are at zero, orders the legs to be stamped in rechecks, and orders No. 2 to set the direction dial on the tripod at Zero. Reports “ No. . . . Correct.”

Section commander, having given direction to both guns, will direct the No. 3 to put in the aiming lamp. He will then collect the zero posts, and return to his gun.

No. 3 of the odd subsection will put in the aiming post, open the box, place on the aiming lamp, secure the box, attach the line and bring the reel back to the section commander. He will then complete his ammunition duties.

NOTE.—When the direction pegs are in rear the procedure will be as above, with the exception that when “ Direction ” is ordered the dial sight will be set at zero on the front pointer.

When the aim and dials have been checked by the section corporal the dial sight will be set at zero on the rear pointer, and checked before the section corporal reports "No. ... Correct".

ELEVATION

Section commander—as for Lesson 80, Platoon drill—Indirect.

Nos. 1 act as in Lesson 80, Platoon drill—indirect, with the assistance of the N.C.O. at the gun. They will then align their collimators on the lamp.

LESSON 86.—TO CEASE FIRING AND ON TRUCKS

Instructor's Note

Additional stores:—

Two section trucks.

Section commander.—

"Unload"—"Clear gun"—"In aiming lamp".

Nos. 1, 2 and 3.—Carry out their duties as in Lesson 72, Section drill—Direct fire.

Section commander.—

"Cease firing".

Gun numbers will act as in Lesson 66, Section drill—Direct fire.

After the guns have been dismounted, the section commander will fall in the section, and check stores. He is himself responsible for the pegs and zero posts.

The section will move back to the trucks led by the section corporal, the section commander moving in rear; on arrival the section commander orders "On trucks".

This drill will be carried out as in section drill, direct fire, except that No. 4 of the odd subsection will replace the aiming post and aiming lamp in the trucks. The section commander will place the zero posts and pegs in his truck until such times as they can be transferred to the platoon commander's truck.

LESSON 87.—FIRE CONTROL CHARTS

Instructor's Notes

Additional stores:—

Two fire control charts, two watches, two zero posts, four pegs.

The section commander and section corporal will each have a fire control chart.

The drill will be as already taught up to the stage of the aiming lamp being put out.

Section commander.—

"Prepare for Task 1".

Section corporal—Reports when his gun is ready.

Section commander.—

"Load"—"Fire".

Each N.C.O. controls the fire of their guns as in platoon drill—indirect (charts).

When not actually firing on a task, guns will always be laid on the fixed line; guns will be half loaded, thumbpiece pressed, and sentries posted.

SECTION 20.—OBSERVATION OF FIRE AND RANGING

GENERAL

1. **Observation of fire** deals with deducing from the strike of the bullets the position of the beaten zone with reference to the target, and is a necessary preliminary to ranging.

Ranging is the process of determining by observation of fire the direction and elevation necessary to hit a given target.

2. Observation of fire and ranging are normally carried out by the fire controller. In heavy fighting, where unit control may break down, control by the firer will become necessary. Except in very favourable circumstances, little reliance can be placed on observation by the firer at ranges over 800 yards. The training in ranging therefore is confined to ranges of 1,000 yards and under, using the naked eye.

3. Personnel will require training as follows:—

Officers and N.C.Os.—To observe and correct the fire at all machine-gun ranges, using field-glasses when necessary.

All ranks.—To observe and correct fire, using the naked eye up to ranges of 1,000 yards.

Range-taker.—To observe fire, using the range-finder, and to report the position of the strike.

4. **Observation of fire.**—

i. The possibility of observation of strike will depend on a variety of factors in addition to the distance of the observer from the target, of which the following are the most important:—

- (a) The nature of the soil round the target. Sand, plough and water generally give good results, but damp ground, long grass and undergrowth are bad.
- (b) Visibility as affected by light, mist or mirage.
- (c) The position of the sun. When low in the horizon strike is easier to pick up than when it is high.
- (d) Wind. A high wind tends to blow away the dust caused by the strike before it can be observed.

The action of the enemy will often be a clue as to whether fire effect is being obtained, *e.g.* cessation of hostile fire, etc.

In war, the fall of shell and the strike of bullets from other small arms near the target will interfere with accurate observation.

ii. It is a fundamental principle in observation of fire only to accept information which is definite or certain, and not to act on what is uncertain or no more than probable. Thus, before any deduction can be made as to the exact position of a beaten zone with reference to the target, it is necessary to decide whether the whole beaten zone is being observed or whether only a small portion of it is falling on ground which gives observation of strike, and if so, what portion of it.

Again, when a foreshortened view of the ground is obtained, it is possible to make errors of great magnitude if guesswork only is relied upon.

iii. In the engagement of targets with width or depth the beaten zones of the guns of the fire unit are distributed over the target according to the method of fire employed. Under these circumstances it is not always possible to determine that full fire effect has been obtained owing to the difficulty of checking each individual beaten zone.

iv. Tracer ammunition is only of value for determining correctness of line.

v. It must be remembered that it is necessary to observe the area in which the beaten zone is to fall, rather than the ground in the immediate vicinity of the definite aiming mark.

vi. It may occur that an area of ground adjacent to the target is specially suitable for observation. Under these circumstances it may be profitable to direct the fire on to this area in the first instance, correcting it on to the target as soon as observation has been obtained.

vii. Bursts of fire must be long enough to enable the beaten zone to be "found", as well as to produce the required fire effect on the target.

5. **Ranging.**

i. Ranging may be carried out:—

- (a) To correct fire on to a target as soon as the data obtained by observation warrant it.

- (b) To register the direction and elevation required to hit a target after fire effect has been obtained.
- ii. It is required to bring the centres of the beaten zones on to their correct positions on the target as soon as possible after the first burst. This may entail corrections for elevation or direction or for both.

LESSON 88.—OBSERVATION OF FIRE

Instructor's Notes

Stores:—

Sand model (or miniature range).

Strips cut to scale to represent beaten zones.

The instruction will take the form of a lecture on the subject matter of Sec. 20, illustrated on the sand model with the aid of models of beaten zones.

The instruction should be completed in the open country indicating types of ground and their effect on the beaten zones, showing approximate dimensions and giving practice to officers and N.C.Os. in use of graticules and field glasses.

The instruction to gun numbers will be confined to ranges up to 1,000 yards.

Opportunity should be taken on all occasions when ball ammunition is used to practise officers, N.C.Os., range-takers and gun numbers in observing the strike of bullets.

LESSON 89.—OBSERVATION OF FIRE AND RANGING

Instructor's Note

Stores:—

Gun, tripod, slide rule or field glasses and prepared range card.

1. Explain.—

- i. The general principles to be followed are:—

- (a) **Only correct when it is certain that full fire effect is not being obtained.**
- (b) When making corrections, unless the correction required can be determined accurately, **over-estimate it rather than under-estimate it**, always provided the safety of our own troops is not involved.

ii. Corrections for line.

Observation of machine-gun fire is normally carried out from a position near the guns. In this case it is possible to measure the exact correction required, either with graticuled glasses, slide rule, or hand angles.

iii. Corrections for elevation.

- (a) It is not possible to determine the exact amount by which the beaten zone is falling over or short of the target.

The length of the beaten zone being known, if the whole of it is seen it will give a useful guide as to the amount of correction to give, e.g. it might be estimated that the distance between the beaten zone and the target is either once or twice the beaten zone as seen on the ground.

- (b) It should be remembered that where a fore-shortened view of the ground is obtained, the tendency will be to under-estimate the correction required.

As a rule, therefore, bold corrections should be given, particularly where there is no guide to the amount required.

The object is to include the target in a bracket rather than to creep towards it by inadequate corrections.

The actual manner in which corrections are given and acted upon will be found in Sec. 11, Lesson 55.

- iv. When fire is being observed from a flank, the fact that the bullets appear to be falling behind or in front of the target as viewed from the observation post will give definite indications as to whether a right or left correction is required.

Again, bullets which are falling on the correct line gun-target will appear from the observation post to be right or left of it.

In these circumstances, to ascertain the actual position of the bullets with reference to the target, it is necessary to visualize the line gun-target on the ground and judge accordingly.

NOTE.—Gun numbers will be required to judge the range to targets up to 1,000 yards, officers and N.C.Os. up to 2,000 yards.

2. Method of instruction.—

i. Elevation.

- (a) Indicate a target to the firer and tell him to estimate the range.
- (b) Using his estimated range, give a fire order to bring fire to bear on this target.
- (c) Indicate the position on the ground where his bullets would fall, according to whether he has over or under-estimated the range.
If this position is very difficult to indicate, lay the gun on it.
- (d) The firer now judges the correction required, adjusts his tangent sight accordingly, relays on the target and continues firing.
- (e) If he has not made a suitable correction, indicate where the bullets are now falling.
- (f) Continue as above until it is considered that he has brought fire to bear on the target.
- (g) The firer now reports the correct range to hit the target.

ii. Direction.—

- (a) Give a fire order to engage any suitable target.
- (b) Indicate the supposed position of the shots right or left of the target.
- (c) The firer deflects his line of sight to the left or right of the target by the amount the shots fell right or left of it originally.
- (d) Check the line of sight. Inform the firer that the shots are hitting the target, or, if the firer is in error, indicate a fresh point of strike and continue as above until the suitable correction has been made.
- (e) The firer now notes his point of aim.

iii. Direction and elevation combined.

The firer will be required to obtain the correct elevation to hit the target, and to indicate a gun aiming mark which will give the necessary deflection right or left of it.

NOTE.—This lesson will be carried a stage further with officers and N.C.Os.; the instructor will indicate the supposed position of the shots from a section or platoon of guns, and the fire controller under instruction will give the necessary correction to bring the fire on to the target.

SECTION 21.—HEADQUARTERS TRAINING

1. The object of headquarters training is to train the personnel of section and platoon headquarters in their duties in the field by day and night under varying conditions and on different types of ground.

2. The training will be carried out with such personnel as are necessary for any particular exercise selected from the following :—

Platoon headquarters.

- 1 Platoon commander.
- 1 Platoon serjeant.
- 1 Orderly.
- 2 Scouts.
- 1 Batman.
- 2 Truck drivers.

Each section.

- 1 Section commander.
- 1 Section corporal.
- 1 Orderly.
- 1 Range-taker.
- 2 Truck drivers.

3. The platoon commander can combine the command of his platoon with directing an exercise.

Gun numbers and machine gun equipment are not required. Vehicles may or may not be taken out according to the exercise, at the discretion of the directing officer. The range-taker will invariably take his instrument when exercises are carried out on the ground. Platoon and section personnel taking part will be required to function correctly and issue the necessary orders based on the tactical situations as pictured by the directing officer.

4. As a preliminary to headquarters training exercises, commanders will be practised in the following :—

- i. Reconnaissance of section areas.
- ii. Reconnaissance of indirect fire positions.
- iii. Procedure in occupation and evacuation of positions.
- iv. Issue of orders.

NOTE.—iii and iv can usefully be carried out in the form of tactical exercises without troops.

5. In the preparation of an exercise—
 - i. Decide on main lessons to be taught.
 - ii. Select suitable ground or prepare sand table.
 - iii. Produce simple tactical situations which will bring out the lessons to be taught.
 - iv. Make sure the orders issued are clear and in themselves a lesson in the issue of verbal orders.
6. In conducting the exercise—
 - i. Assemble personnel taking part where the exercise starts.
 - ii. Explain situations, issue any necessary orders. Personnel then act in accordance with the situation, and issue orders if necessary.
 - iii. Criticize action and orders.
 - iv. Issue subsequent situations, criticize action and orders at each stage.
 - v. When necessary the conducting officer will represent gun numbers for the purpose of receiving instructions.

SECTION 22.—FIELD DUTIES

INTRODUCTORY

1. General.

i. The field duties of a platoon are dealt with in the lessons which follow. The details of procedure and occupation of positions will depend on the orders given by the M.G. company commander, whose preliminary arrangements are given in paragraph 8 below.

ii. Platoon areas are generally selected by the company commander, who must satisfy himself that the task can be carried out from the area detailed. In order to reduce the time required for reconnaissance by the platoon commander, such areas should be as well defined as possible.

The number of platoons that can be accommodated, even in direct fire positions, on a particular piece of ground without loss of concealment and with reasonable safety from artillery fire is limited.

iii. Owing to the difficulty of locating targets exactly, a platoon commander may often receive a target in general terms, e.g., a patch of gorse or front edge of a wood. In this case he must, by every means in his power, attempt to locate the exact position of the enemy in the locality described, so that ammunition is not wasted by firing on unoccupied ground.

iv. In the occupation of a position it will be the duty of the platoon commander to determine before the position is occupied that the first target can be engaged or task carried out with safety to our own troops. When he is not controlling, he will, in his orders for the occupation of the position, inform the fire controller or controllers concerned that it is safe to fire on the first target, and will point out the position of our own troops.

The responsibility for subsequent safety will be with the fire controller.

The platoon commander should assist by keeping him informed regarding the movements of our own troops.

2. (i) **Fire direction** is the term used for the orders given by a commander of two or more fire units regarding the manner their fire is to be applied, and covers, therefore, the immediate orders given to a fire controller.

ii. When firing direct, the platoon commander directs the fire of his two sections, the fire being controlled by the section commander. The only means of communication at

the disposal of a platoon commander for directing the fire of his platoon is by orderly or signal. As a guide, therefore, it is considered that where a whole platoon is required to fire over one arc, the two sections should not be further apart than about 300 yards. To minimize the effect of shell fire and to assist concealment, they should not be closer than about 100 yards.

iii. The platoon commander, in deciding whether he will order one arc for both sections or an arc for each, should remember that for ranges over 1,500 yards the fire of four guns is advisable in order to get full fire effect. Therefore, when targets over that range have to be engaged, they must be included in the arc of each section.

3. Direct fire.

i. The platoon commander reconnoitres his platoon area with a view to selecting section areas, platoon headquarters and tactical O.P. and decides on the disposal of his vehicles to positions under cover.

In deciding on section areas, the platoon commander will look for positions which offer the following advantages :—

Suitable for the task.

Covered approaches.

Concealment for guns.

Ease of control.

Covered positions for vehicles.

ii. The section commander reconnoitres his area for position for each gun and a control post. In selecting these the section commander will consider the points detailed in the platoon commander's reconnaissance above. To prevent the occupation of unnecessarily exposed positions, he should be clear as to the exact nature of his task and the near limit of arc.

There are three alternative methods of bringing the guns into action open to the section commander :—

(a) To use the section orderly, when available, to mark one gun position while he himself marks the other one, the guns being ordered or signalled into action independently.

(b) To signal the guns up in turn, pointing out to each No. 1 as he arrives the gun position, first target, arc of fire and reference points.

(c) To go back and bring forward Nos. 1 with tripods as far as cover allows and point out gun positions, etc., as in sub-para. (b) above.

iii. When firing over an arc, section commanders must exercise great care in the selection of targets and the moment

to open fire. Targets which will have the greatest effect on the operations must be engaged first, and fire unit commanders should not allow themselves to be led into firing on targets which may be more obvious but not so dangerous tactically.

Premature opening of fire against unimportant targets may have the effect of disclosing the positions of the guns unnecessarily and drawing enemy fire.

iv. In deciding on the rate of fire to be used the following factors must be taken into consideration :—

The tactical situation, the target, the range, the state of the ammunition supply and the effect it is desired to produce in a given time.

4. Indirect fire.

i. The main occasions on which indirect fire is or might be employed may be summarized as under :—

(a) When it is impossible, or inadvisable to occupy a direct fire position.

(b) In darkness, mist or smoke.

(c) When guns placed in depth, in direct fire positions to prevent penetration in defence, can only fire in front of the foremost troops by this means.

(d) When it is desired to place some guns in positions from which they can be easily withdrawn, and where direct positions would not give such facility.

ii. When firing indirect, the platoon commander controls the fire of the platoon, unless the tactical situation demands his whole attention or he is concerned with liaison duties. In these cases he will delegate the fire control to the platoon sergeant.

The platoon commander reconnoitres for :—

(a) A position for the guns.

(b) Fire control observation post.

(c) Positions in readiness.

(d) Covered positions for vehicles.

iii. In selecting the gun position the commander is influenced by :—

(a) Crest clearance.

(b) Enemy observation. This may be from the flanks.

5. Platoon headquarters.—The requirements are :—

i. Ease of communication between sections, the O.P. and platoon headquarters, and between platoon headquarters and company headquarters.

ii. Good covered approach.

iii. Concealment.

6. Observation post (O.P.).—The requirements are :—

- i. View of enemy positions or lines of approach and ground over which our own troops may move.
- ii. Good covered approach.
- iii. Accommodation for the required number of men.
- iv. Concealment.

7. Control post (C.P.)

Technical considerations affect the selection of the control post. The following requirements, however, should receive attention :—

- i. Full view of the whole arc for which the section is responsible.
- ii. As inconspicuous as possible.
- iii. Good covered approach.
- iv. Accommodation for required number of men.
- v. Concealment for fire control signals to be made.
- vi. Within voice control of the guns.

8. Preliminary arrangements by the company commander.

- i. Machine gun fire will normally be required as part of an organized fire plan.

Machine gun companies may be placed under the orders of or in support of, a formation or unit. In all such cases the M.G. company commander will maintain close contact with the formation or unit commander.

- ii. To ensure that in any fire plan in which machine gun fire is to be used, there is no delay in preparations for the production of fire, certain preliminary arrangements by the company commander will have to be made and in the following sequence.

(a) Initial orders for the distribution and, where necessary, the movement of platoons.

(b) Preliminary order from the company commander when action is likely to be imminent. This order will contain instructions for the platoon commander (or commanders) to join him and for any special movement to rendezvous by platoons under the platoon serjeant. Where the company commander appreciates the necessity for early action by section commanders, he will order platoon commanders to bring them forward. The preliminary order will contain sufficient information to enable platoon commanders to carry out any preliminary reconnaissance before receiving orders.

- (c) After receiving requirements from the formation or unit commander and after necessary reconnaissance, orders to platoon commanders, which will include the following :—

Information.
Intention.
Platoon rôle.
Area.
Tasks in detail (including S.A.A.).
Timings.
Inter-communication.
Administration.

9. Distribution of personnel and loads to vehicles.

The detail of loads and distribution of personnel to vehicles are shown in Section 15, and are based on :—

- i. Availability of equipment and stores.
- ii. Restrictions imposed by weight and seating accommodation.
- iii. The necessity for means of forward reconnaissance without undue disturbance of personnel.
- iv. The fact that when a commander is required to carry out a task, whether as a section or as part of the platoon, his rangetaker must be available in the earliest stages of his reconnaissance.

The procedure for reconnaissance and occupation which follows is outlined to meet ordinary conditions. Under certain circumstances modification may be necessary and it is left to the commander to decide, in accordance with the situation, whether he can dispense with any detail or alter procedure.

The employment of the platoon (motor cyclist) orderly in these field duties is not specified because of its dependence on varying communication requirements.

METHOD OF INSTRUCTION

Instructor's Notes

The method of instruction will be as follows :—

1. Lecture on the subject matter of paras. 1 to 8 above.
2. Teach and explain the duties in each lesson with the aid of a prepared sand table.
3. Headquarters training exercises on the ground or sand table with the personnel required for any particular phase.
4. The duties of all commanders will be further practised in section and platoon training exercises, where all personnel and equipment are present. Technical as well as tactical problems should be included in these exercises.

LESSON 90.—OCCUPATION OF A POSITION —DAY

The platoon commander

1. On receipt of the company commander's orders the platoon commander will send a message to the platoon serjeant, including :—

Brief information.

Platoon rôle.

Order to move the platoon to a rendezvous in the neighbourhood of the area indicated by the company commander.

His own action.

The choice of route may be left to the platoon serjeant.

2. The platoon commander will move to his allotted area in his truck. At this time he may or may not have his section commanders with him. If they are not present, he will adopt one of the following procedures, depending on the situation and time available :—

i. He will, if possible, move by way of the platoon R.V. He will take the section commanders forward with him on his reconnaissance.

ii. If for any reason he cannot move by the platoon R.V., he will move to his area by the most convenient route. On arrival he will decide whether to employ direct or indirect fire.

Should he decide to employ direct fire, he will debus his truck personnel and send the truck to the platoon rendezvous, giving the driver instructions to bring the section commanders up to the area.

iii. Where it is possible for the platoon to be moved to a R.V. close to the area, and when time permits, he may send an order for all N.C.Os. to come forward on foot and meet him.

Whichever procedure is adopted, as soon as the platoon commander has decided whether to employ direct or indirect fire, and has ensured that the section commanders will be available to receive orders, he will carry out his reconnaissance. He will ascertain the positions of own troops, and the nature and extent of the targets. He will use the rangetakers to solve any overhead problems.

3. (i) If he decides to employ direct fire, the platoon commander will decide on :—

Section areas.

Positions in readiness for each section.

Arcs of fire and/or targets.

Positions for trucks under cover.

Arrangements for local protection.

Positions of O.P. and platoon H.Q.

ii. On completion of his reconnaissance, the platoon commander will issue orders to the section commanders including as many of the following points of method as may be necessary according to the situation :—

Information.

Intention.

First target and/or arcs of fire.

Section areas.

Positions in readiness.

Arrangements for local protection.

Factors affecting safety.

Ammunition allotted.

Position of section trucks under cover.

Position of Pl. H.Q. and Coy. H.Q.

iii. He will send section commanders, accompanied by their rangetakers and orderlies, to section areas to carry out their reconnaissance on foot.

4. i. The platoon commander will return to the platoon R.V. in his truck and will give orders to platoon serjeant and section corporals as under :—

Brief information.

Intention.

Positions in readiness and routes to them.

Section areas.

Ammunition required.

He will send the section corporals to lead their sections to their positions in readiness ; he will give additional orders to the platoon serjeant concerning :—

Position of platoon H.Q.

Local protection, and the siting of the anti-tank rifle.

When the platoon serjeant has carried out these duties he will report to the platoon commander for full information.

ii. Alternatively where ground permits, the platoon commander having completed this reconnaissance may point out to the orderlies the position in readiness for each section, and will tell them how many belts are required.

He will send them to the platoon R.V. in his truck, with orders to guide the sections to their respective positions in readiness, and to inform the platoon serjeant of the position of platoon H.Q.

He will then issue orders to the section commanders as in (3 ii) above and will send them on their reconnaissance.

On the arrival of the platoon serjeant, he will give him orders including :—

Information.

Positions of O.P., Pl. H.Q. and cover for vehicles.

Local protection and the siting of the anti-tank rifle.

5. When both sections have been reported in action, the platoon commander will send the platoon orderly to company H.Q. to report the platoon in action.

The section commander

6. The section commander, on receipt of orders, will proceed to his section area accompanied by his rangetaker, and orderly if available.

i. On arrival he will give orders to the rangetaker regarding :—

Arc of fire.

Points to which he requires ranges (i.e. targets and such points as will help him in the solution of any safety problem).

Time available.

Probable position of control post.

ii. He will reconnoitre for :—

Control post.

Two gun positions.

iii. He will decide on reference points and on the method by which he is going to bring the guns into action.

iv. He will bring the section into action by one of the methods given in Sec. 22, 3.

v. When the section is in action, he will report this fact to Pl. H.Q.

The section corporal

7. i. On receipt of the platoon commander's orders will lead his section to its position in readiness.

ii. On arrival at the position in readiness, he will order "... belts, prepare for action", will supervise the prepare for action, detail loads, and lead the section forward to the section area.

iii. He will order guns into action when signalled for by the section commander, and will then report to the section commander for details regarding arcs of fire, targets, etc.

iv. He will dispose of the vehicles under cover as ordered. He will organize the chain of supply from the vehicles to the section area.

8. Should it be considered possible for all N.C.Os. to be brought forward initially, the following modifications from the procedure given above will be made :—

i. On arrival at the platoon area, the platoon commander will debus his truck personnel, and will send the truck back to the platoon R.V. to bring the platoon to a forward R.V. close to the area.

ii. At this latter rendezvous he will issue orders or will leave an orderly with instructions as to where all N.C.Os. are to join him. On completion of his reconnaissance he will give orders to all N.C.Os. as in 3 ii. above.

iii. On receipt of these orders, the platoon serjeant and section corporals will return to the platoon and carry out their duties as given in paras. 4, i. and 7 above, section commanders accompanied by rangetakers and orderlies moving direct to their section areas and carrying out the duties given in para. 6 above.

9. Duties during action.

i. Platoon commander.

(a) Keeps in touch with the situation, carrying out reconnaissance where necessary.

(b) Issues fire direction orders as required.

(c) Reports the tactical situation and ammunition state to the company commander.

ii. Section commander.

(a) Controls the fire of his section and interprets the fire direction orders of the platoon commander into fire control orders.

(b) Locates and deals with targets in his arc.

(c) Solves safety problems as they arise, and indicates safety limits.

(d) Makes arrangements to continue firing in case observation is at any time interrupted.

LESSON 91.—MODIFICATIONS FOR INDIRECT FIRE

1. Duties on decision to occupy the position.

The platoon commander

i. Having decided to employ indirect fire, the following modifications will be made in the procedure for the occupation of a position given in Lesson 90.

- ii. (a) On arrival at his area he may or may not be accompanied by his section commanders.

If they are not present, he will send his truck to the platoon rendezvous with instructions to the driver to bring the platoon forward to a R.V. close to the area.

At this latter rendezvous he will either issue orders, or will leave an orderly with instructions as to where all N.C.Os. are to join him. The senior section commander will bring his director.

- (b) Should the section commanders be accompanying the platoon commander, he will ensure that the platoon is led forward from the platoon rendezvous to some point near the position to be occupied, which will be convenient as a position in readiness. This will entail his making a rough decision as to the gun position and the position in readiness before sending off his truck.

- iii. The platoon commander will give orders to the range-takers as under :—

First target.

Any other points to which ranges are required.

Time available and place to which to report ranges.

- iv. He will decide on :—

Gun positions.

Gun frontage.

Position in readiness.

Method to be employed.

Position of O.P. and Pl. H.Q.

Position under cover for vehicles and a point to which they will return when ordered.

- v. He will issue either to all N.C.Os. or to the section commanders in the case where they only are present, orders which will include :—

Method of indirect fire to be employed.

Gun position and pivot gun if necessary.

Gun frontage.

Position in readiness.

Ammunition required.

Position under cover for trucks, and point to which they will return when ordered.

Arrangements for local protection.

Position of O.P., Pl. H.Q., and Coy. H.Q.

When fire is to be opened.

vi. The platoon commander will now complete his calculations to engage the target. At the first available opportunity he will give the platoon serjeant full information.

vii. Should all N.C.Os. not have been present when the platoon commanders' orders were issued, the junior section commander will be responsible for meeting the platoon at the Position in Readiness and informing the platoon serjeant of the position of platoon H.Q. and the O.P. and of arrangements for local protection.

He will then take charge of the prepare for action as laid down in platoon drill—indirect fire (Lesson 73), and will inform the senior section corporal of the position under cover for the trucks.

2. Duties during the occupation.

- i. The platoon serjeant—

Establishes platoon H.Q.

Arranges local protection as ordered.

Reports to the platoon commander for full information.

- ii. The senior section commander—

Having received the platoon commander's orders, calculates minimum Q.A., supervises the guns coming into action, and carries out the duties laid down for him in platoon drill, indirect fire.

- iii. The junior section commander—

Moves the platoon to the position in readiness, and, on arrival orders "... belts—for indirect fire—prepare for action". If necessary he details loads to higher numbers.

Moves the platoon forward in rear of the gun position. Carries out the duties laid down for him in platoon drill—indirect fire.

- iv. The senior section corporal—

Assisted by the junior section corporal, sends the vehicles to the position under cover and tells the drivers where to return on being ordered.

Organizes the chain of supply.

3. Duties in action.

- i. The platoon commander—

As in a direct fire position, except that normally he controls the fire of the platoon.

- ii. The platoon serjeant—

Acts as second-in-command of the platoon and is prepared to take over the duties of the fire controller.

- iii. The senior section commander—
Commands at the gun position and reports ammunition state to the platoon commander.
- iv. The junior section commander—
Carries out such duties as laid down for him in platoon drill—indirect fire.
- v. The senior section corporal—
Assisted by the junior section corporal supervises and controls the supply from the vehicles to the gun position.

LESSON 92.—OCCUPATION OF A POSITION—NIGHT

Duties where preliminary reconnaissance can be carried out in daylight

1. Before occupation.

The platoon commander

- i. (a) The platoon commander proceeds to his platoon area, taking with him a reconnaissance party consisting of :—
Two section commanders with directors and pegs.
Two rangetakers.
Two orderlies.
If not otherwise required the platoon serjeant may accompany this reconnaissance in place of one of the orderlies.
- (b) On arrival, he carries out his reconnaissance including the selection of gun positions.
He orders the necessary ranges to be taken.
He, and the platoon serjeant, if present, proceed to carry out the pegging of the positions (as in Sec. 26) assisted by the section commanders.
- ii. He now decides on :—
(a) The type of concealment and extent of digging to be carried out.
(b) Positions in readiness for the sections and a rendezvous for the platoon.
(c) The approaches from the rendezvous to the positions in readiness and to the gun positions, arranging that these routes can be recognized in the dark.
(d) The place to which vehicles will proceed after unloading, if they are to remain under platoon control.
(e) Arrangements for local protection.
(f) The position of platoon H.Q.

iii. He gives the platoon serjeant and section commanders all available information regarding enemy, own troops and targets, and issue orders on the points included in sub-para. ii above.

He leaves the rangetakers or orderlies in the platoon area to safeguard the preparations made for occupation.

iv. When the reconnaissance is completed the party, less those required to safeguard the preparations, will return to the platoon, where the platoon commander will :—

- (a) Prepare fire control charts and issue and explain them to the N.C.Os. concerned.
- (b) Issue all available information to the platoon.

v. On occasions the reconnaissance party may have to be reduced to a minimum :—

- Platoon commander.
- 1 rangetaker.
- 1 man with director and pegs.

In this case the platoon commander will be responsible for the pegging of both section areas.

He will issue orders as in iii above on return to the platoon.

2. Duties on occupation of the position.

- i. On arrival at the rendezvous, if the section commanders were present during the reconnaissance they lead their sections direct to the positions in readiness and come into action.
- ii. If the section commanders were not present during the reconnaissance, the platoon commander takes forward one section commander to his position in readiness and points out the gun and direction pegs. He then returns to the rendezvous and leads the other section to its position in readiness and points out gun and direction pegs as for the other section.
- iii. When necessary he orders the platoon serjeant to collect the section vehicles and take them to the pre-arranged place.

3. Duties when no daylight reconnaissance is possible.

- i. It is possible to arrange for fixed lines with fair accuracy at close ranges, provided that a light can be shown on the place where the fire is to fall.
The platoon commander first chooses positions for his sections by personal reconnaissance.
- ii. Having given orders for the occupation of the positions he proceeds with a torch to the place or places where he requires the fire of the sections, and exposes a light in the direction of the guns. (For technical procedure, see Lesson 131.)
- iii. A signal must be arranged to notify the platoon commander when guns have been correctly laid.

LESSON 93.—DUTIES SPECIAL TO DEFENCE

1. Duties on decision to occupy a position.

In addition to the points already given in Lesson 90, para. 3, ii, the platoon commander will include in his orders :—

- (a) The position of our own troops in the vicinity of section areas and arcs of fire.
- (b) Approximate areas in which fixed lines are to fall.
- (c) Signal for defensive fire and rates of fire on fixed lines.
- (d) Any special orders for local protection and concealment.
- (e) Orders regarding digging.
- (f) Intercommunication.

2. Duties during the occupation.

i. The platoon commander—

- (a) Having given his orders, he will ascertain from rifle units near his gun positions and in the area where his defensive fire is required to fall, the exact dispositions of their troops, so as to ensure necessary safety. He will also ascertain the positions from which the signal for defensive fire will be sent up.
- (b) He returns to the section positions and gives orders in detail as to fixed lines, the positions from which the signal for defensive fire will be sent up, and any other points in para. 1 above, not already sufficiently dealt with.
- (c) He then visits near-by infantry company commanders and arranges to keep in touch with them.
- (d) As soon as he receives messages from his sections that they are in action, he reports his platoon in action to his company commander.

ii. The platoon serjeant—

Having established platoon H.Q. and arranged for local protection (including the siting of the A/Tk rifle), proceeds with platoon H.Q. vehicles to the position or positions ordered, takes over the section vehicles from the section corporals, and moves the whole as ordered.

He will then return to platoon H.Q. and obtain full information from the platoon commander.

iii. The section commander of each section.—

On arrival in his section area, in addition to his duties given in Lesson 90, para. 6,

- (a) Orders the rangetaker to construct a range card for the arc, naming the points to which he requires ranges.
- (b) Orders the guns to be mounted to cover the arc.

- (c) Immediately he receives details of the fixed line, has the guns laid on this line (Lesson 129, 130).

Note.—Where guns have a forward task in addition they will be laid initially on the forward fixed line and arrangements made for the switch from forward to penetration fixed line.

Posts sentries.

- (d) Arranges for the concealment of the position and stores.
- (e) Organizes digging.
- (f) Orders the section corporal to take the vehicles to the position ordered.
- (g) Sends the section orderly to platoon H.Q. to report section in action.
- (h) Informs all ranks of the signal for defensive fire, the action to be taken in case of alarm, the position of temporary alarm post, and the details of ranges.
- (i) Selects permanent alarm posts, makes out the duty roster.
- (j) Marks in on his range card the area within his arc in which it is safe to fire.

He will take the earliest opportunity of visiting infantry posts near his area.

Note.—Throughout the occupation of the position and whilst in action the section commander will—

Ensure that any information regarding enemy, own troops, etc., received is immediately passed on to all ranks of his section.

iv. The section corporal of each section.—

- (a) Ensures that all stores are removed from the vehicle, taken forward and placed under cover near the gun position.
- (b) When ordered by the section commander moves the section vehicles to the position ordered and hands them over to the platoon serjeant.
- (c) Reconnoitres for a supply of water.
- (d) Reports to the section commander for full information and informs him of the result of his reconnaissance for water.

LESSON 94.—DUTIES SPECIAL TO WITHDRAWAL

1. The occupation of a position under conditions of withdrawal.

i. The normal duties for occupation of a position in defence will be carried out, but special consideration will be given to

readiness for movement and to facilities for a quick and covered withdrawal.

ii. Provision must be made for bringing trucks as close up as possible, consistent with safety, to section positions when the guns are ordered out of action. A platoon commander will normally choose these forward positions for his section trucks and notify them in orders to section commanders and corporals, but on occasions the selection may rest with section commanders, who will themselves inform their section corporals.

2. Preparation for withdrawal to a new position.

i. The platoon commander.

Previous to the withdrawal he will reconnoitre the route to be followed. He may delegate this duty to his platoon serjeant and may also instruct the latter to reconnoitre the new position. During the reconnaissance of the route of withdrawal any likely intermediate fire positions will be noted.

He will issue verbally, or by orderly, preliminary orders which will lay down:—

- (a) The method of withdrawal, including the route or routes to be followed.
- (b) A platoon rendezvous in rear of the first position or section rendezvous on the new position.
- (c) How the order to withdraw will be given (personally, in verbal or written message or by signal).
- (d) The line of withdrawal of platoon H.Q.
- (e) Instructions as to keeping touch within the platoon during the withdrawal.
- (f) A reconnaissance plan for the new position.

ii. The section commander.

He is responsible for reconnaissance of the route from his section position to the platoon rendezvous or to his section rendezvous on the new position. He may delegate this task to his section corporal.

3. Reconnaissance of a new position.

i. When it is required to send a reconnaissance party back to prepare a new position, the following personnel, as a minimum can undertake the duties:—

Platoon serjeant.
1 rangetaker.
2 gun numbers.

The party will travel in the platoon serjeant's truck, taking pegs if likely to be required. The platoon orderly should accompany them.

ii. The platoon serjeant—accompanied by the minimum reconnaissance party.

- (a) In accordance with the orders he has received and after reconnaissance of the ground will select section areas, gun positions, and positions in readiness and a platoon control post.
- (b) Will point out the arcs of fire of the sections and reference points within these arcs to the range-taker, who will take the necessary ranges and prepare range cards for both sections.
- (c) Will point out the section gun positions, arcs of fire and positions in readiness to the 2 gun numbers, who will act as section guides. The guides will then be posted on the line of withdrawal of the platoon, or if the sections are withdrawing independently, at section rendezvous, from where they will lead the sections to their respective areas.

On arrival in these areas the guides will there give the section commanders all known information about the section positions.

- (d) Will send a message to the platoon commander informing him where the section guides will be posted and giving any essential information regarding the new position. He will remain on the new position, meeting the platoon commander on the latter's arrival there, and reporting fully about it and the situation as known. The platoon commander will in turn communicate that information to the section commanders.

4. Withdrawal to the new position.

i. The platoon commander.

- (a) Will give personally or send the order to withdraw, including any of the points in para. 2, i, above, which he has not previously given.
- (b) Will control the movement of the sections from the platoon rendezvous or, if the sections move independently to the new position, keep touch with their progress.

ii. The section commander.

- (a) On receipt of the order to withdraw will order "Cease firing"—and, having signalled to the trucks to come up to their forward positions, "on truck".
- (b) When all stores and personnel are on the trucks will lead them back by the selected route to the platoon rendezvous or to the section rendezvous.

iii. The section corporal.

Will be responsible for sending the trucks forward when signalled up by the section commander. He will then assist the latter in controlling the "On truck" action.

APPENDIX I

SPOTLIGHT APPARATUS FOR TRAINING
M.G. PERSONNEL

After the apparatus has been correctly assembled to the gun, and all connections made (see sketch in box), the following is the procedure :—

Focusing.—Telescopic focus from the rear end of the spotlight projector.

Harmonizing.—The light must be harmonized with the tangent sight and this is done as follows :—

Set the spotlight sight (converted Lewis gun sight) and the tangent sight to the same range, *e.g.* 1,500 yards. Lay the gun on a good aiming mark and bring the light on to it by making vertical adjustments by means of the thumbscrew on the projector, and lateral adjustments by means of the clamping screw *underneath* the projector sight. Extreme accuracy is required in making these adjustments.

The apparatus is now ready for use.

The apparatus can be used for teaching N.C.Os. and men, and exercising them in indication and recognition, and for demonstrating fire orders, and exercising men in interpreting fire orders, using combined sights and making corrections for wind.

In demonstrating fire orders it is necessary that the light should be controlled from the thumbpiece switch in conjunction with the vibrator, this is done quite easily by connecting the wiring up in a different way.

On the fire order being given the gun Nos. carry out their duties in the normal way. In order to maintain the harmonization of the light with the tangent sight, it is necessary for the instructor or an assistant to adjust the projector sight to correspond with the tangent sight.

Example.—The order is given "All 1,400".

No. 1 sets the tangent sight to 1,400 yards.

The instructor or assistant sets the projector sights to 1,400 yards.

In the case of combined sights.

The order is given "... No. 1 1550. No. 2 1650."

Nos. 1 set their tangent sights as ordered.

The instructor or assistant sets the projector sights to 1,600 yards, *i.e.* the correct range.

This will have the effect on the target of one gun being slightly high, and the other being slightly low, and on opening fire the rings of light will have the appearance of overlapping beaten zones. It is here that the necessity for extreme accuracy in harmonizing is seen.

In teaching or exercising men in fire orders it is necessary that the light should be controlled independently of the thumbpiece switch. Hence the press switch which is controlled by the instructor. This is necessary for the following reason :—

Instead of the No. 1 carrying out his duties as taught, occasionally checking his aim between bursts, traversing correctly 15 minutes, relaying on the command "Stop", etc., he would allow himself to be guided by the light. Whereas if the instructor controls the light, he can produce as necessary for the purpose of checking the actions of the No. 1.

Making correction for wind.

On the upper side of the clamping plate of the projector sight will be seen a series of graduations. These are for making or checking corrections for wind. The graduations are of 15 minutes, and are adjusted by means of the small milled head screw at the side. Normally this scale must be kept at zero.

On a wind correction being ordered, the No. 1 makes his adjustment by tapping his gun. The instructor or his assistant adjusts the projector sight the amount ordered. On opening fire the light should now still fall on the target, showing whether the man's adjustment is correct or otherwise. On completion of the fire order care must be taken to re-zero the wind scale.

The vibrator should be used to teach the correct length of burst according to the range, and later as a check on the man in doing so.

In using the apparatus the following suggestions are made :—

1. Service guns should be used to eliminate as far as possible any play between the gun and tripod.

2. As the apparatus will normally be used indoors, a "T" base or sand-bags should be used to allow the traversing clamp to be adjusted correctly by the No. 1.

3. Guns must be placed as close together as possible, otherwise, as the guns are switched about over the landscape target, the light will tend to go out of focus, and errors will creep into the harmonization.

APPENDIX II

INFANTRY PACK

1. The pack is used as the normal method of carrying guns and equipment by machine-gun platoons in countries where the nature of the ground is unsuitable for vehicles.

2. It is desirable that animals for machine gun packsaddlery purposes should be carefully selected. Those with abnormally broad hips, or with points of the hips very prominent, should not be chosen.

3. Description and assembling of packsaddlery.—

Instructor's Notes

Stores:—

As shown in the table below.

DETAIL OF INFANTRY SETS

(For infantry whose equipment is carried on pack)

Description	Number for each	
	Gun and tripod set	Ammunition set
(1)	(2)	(3)
<i>Section D.1</i>		
Bands, belly, P.M.G.	1	—
Bands, belly, P.M.G., straps, long	1	—
Bands, belly, P.M.G., straps, short	1	—
Bands, belly, P.M.G., straps, supporting	2	—
Bits, bridoon, P.G.S.	1	1
Breechings, P.G.S., Mark V	1	1
Caps, shovel, Mark II*	1	—
Cases, horseshoe, P.G.S.	1	1
Chains, collar	1	1
Collars, breast, P.G.S., Mark V	1	1
Collars, head, P.G.S., Mark IV	1	1
Cruppers, P.G.S., Mark V	1	1
Girths, P.G.S., Mark V	2	2
Girths, leather	—	1
Hangers, gun, sling	1	—
Hangers, tripod, sling	1	—
Pannels, P.G.S., Mark V pairs	1	1
Racks, boxes, belt, ammunition, infantry	1	2
Reins, bridoon, P.G.S.	1	1
Straps, girth, P.G.S., Mark II	4	4
Straps, pick and helve	3	—
Straps, detachable, shovel	1	—
Trees, P.G.S.	1	1

The sets of packsaddlery comprise certain articles of general service packsaddlery, supplemented by other articles of machine gun packsaddlery.

Each article of packsaddlery will be described.

Explain and demonstrate how the parts are assembled.

4. Description.—

Articles common to both cavalry and infantry sets

Case, horseshoe.—For cavalry sets, the pattern formerly used for harness purposes, modified by the removal of the link from the back and the release of the strap with the chape (the latter being reduced in width to the size of the strap) are used.

For infantry the pattern formerly used for harness purposes (unmodified) is utilized.

Bit, bridoon.—Is an ordinary bridoon bit, but tinned to prevent rust. The mouthpiece is fitted at each end with a ring to receive the iron stops on the reins when the ordinary packsaddlery reins are used, or for universal saddlery reins to buckle to. The "T" pieces are secured to the rings by links and solid loops, and are for fitting under the leather loops on the packsaddlery head collar.

Breeching, Mark V.—Is used for preventing the pack-saddle from slipping forward. The straps buckle to the body part of the breeching after being looped to the links on the pannels. It is supported by its hip strap, which passes through a loop on the crupper before bucking.

Collar, breast, Mark V.—Is used to prevent the load from slipping back. The straps, after passing through the links of the pannels buckle to the body part of the breast collar. It is supported by its own neckstrap.

Collar, head, Mark IV.—Similar in design to the universal saddlery head collar, but the furniture is tinned iron, and it is fitted on the lower part of the headpiece with leather loops for the "T" of the bridoon bit to fit into, and with a ring on the noseband.

Crupper, Mark V.—Is made with forked straps, which after being looped to the rear arch of the packsaddle, buckle to the body of the crupper. The use of the crupper is to assist in preventing the saddle slipping forward.

Girths, Mark V.—Girths are made of worsted web. They are fitted with chapes and buckles at either end to connect up with the girth straps. These girths have no connecting piece as in earlier patterns, but may be crossed when girthing up if desired.

Girths, leather.—Is a leather steadying girth, with a billet and buckle at each end. It can be lengthened by the "strap, extending".

Pannels, Mark V.—Each pannel consists of a leather back, with tan dowlas lining, the stuffing being horsehair. They are attached to the side bars by leather pockets, the front pocket having a strap and buckle for securing purposes. An opening in the outer side admits of adjustment of the stuffing.

Pannels are fitted with links to take the straps of the Mark V breast collar or breeching—the hooks attached to such links are intended for the chains of earlier marks.

The stuffing can be adjusted as required and kept in position by additional spot stitches if necessary.

Straps, girth, Mark II.—Are for buckling the packsaddle girth to. They are of leather, and made with a loop at one end.

Cap, shovel, Mark II.—Is a leather cap, made to fit on the pan of the G.S. shovel. It has a detachable strap (apart from the "strap, shovel" which do not form part of the cap), which is used for securing it.

Straps, pick and helve, shovel.—Are for use with the articles shown in the "Details of Sets".

The "straps, pick and helve", are for suspending the articles in question as part of the load.

The "strap, shovel", retains the handle of the shovel against the rear arch of the packsaddle.

Articles special to infantry sets

Trees, P.G.S.—Consists of two steel arches (to which rigid hanging hooks are riveted) connected by sidebars made from padouk or sabicu wood.

The arches are jointed to the side bars to admit of them turning automatically, thus allowing of adjustment to the backs of large or small animals, or to meet loss of condition, and to obviate the necessity of several sizes.

The sidebars are slotted for the girth straps to loop on.

Bands, belly.—These belly bands are broad leather girths 52½ in. in length by 3 in. in width, fitted at either end with a buckle and fixed leather loop to connect with the "straps, long", and "straps short", which follow.

Straps, long (or straps, short).—Are straps fitted at one end with a fixed leather loop. The long strap is 48 in. by 1½ in. and the short 40 in. by 1½ in.

Straps, supporting.—These are narrow straps, 13 in. by ¾ in. which prevent the belly band dropping to the ground when the above-mentioned long and short straps are unbuckled to release the load.

Chains, collar, P.G.S.—Are used for infantry in place of the headrope. It consists of a length of chain with a bent "eye" link at one end, and a "T" piece at the other. It is also fitted with two cross aperture links for the "T" to pass through as required.

Hanger, tripod, sling.—Is designed so that the tripod may be slung in it to the hooks of the packsaddle. It consists of a wood bearing bar, added to at the rear end by a wood block which keeps the tripod away from the animal's hip. Leather slings, felt lined, are attached to the bearing bar, the front sling being wider and longer than at the rear. Both slings are fitted at either end with metal dees for hooking to the packsaddle, and the upper dees are provided with strap and buckle for securing both dees after the tripod is slung.

Hanger, gun, sling.—Is constructed on the same principle as the tripod hanger, but is intended for the carriage of the gun. It differs from the tripod hanger in the following respects:—

The bearing bar is added to at **either** end by wood blocks which extend below it, and keep the gun sufficiently away from the side of the animal.

Both slings are of similar width.

A leather chape, carrying a metal square is screwed to the centre of the bearing bar on the upper side for the "girth, leather" to buckle to when required.

Racks, boxes, belt, ammunition, infantry.—Consist of a canvas body with a wood bottom and rope slings. The body is bound with leather at the lower edge as also at the four upper corners, and is attached directly to the wood bottom at its outside edges. No partitions are arranged, but a shaped metal plate is inserted at each corner in order to strengthen them and define the shape at the top.

The rack is suspended by a rope sling at either end, which passes under the bottom and outside the ends. A metal square is attached to the wood bottom for the leather girth to attach to, and holes are made for drainage purposes.

Reins, bridoon.—The rein is made from Preller leather. It is fitted at each end with a tinned iron stop to connect with the rings of the bit.

5. To assemble the parts.—

General instructions

NOTE.—The front arch of the packsaddle tree is narrower than the hind arch.

Packsaddle.—The tree is the frame of the packsaddle. The pannels are attached to the tree by means of front and rear pockets, into which the side-bars are inserted. The front pockets are fitted with buckles and straps for securing purposes.

The **girth straps** are looped to the side-bars over the upper edge, through the slots cut for the purpose.

The **girths** are buckled to the girth straps on the off side in readiness for use.

The **crupper straps** are looped to the rear arch of the packsaddle and then buckled to the body of the crupper.

Bit, bridoon.—The **bridoon bit** at one end may be passed through the leather loop on the off-side of the head collar in readiness for "bitting" the animal.

Breechings ; collars, breast.—The straps of the breeching are first looped to the links on the pannels and then buckled to the body part of the breeching. The straps of the breast collar, after passing through the links of the pannels, are buckled to the body part of the breast collar.

Instructions special to infantry sets

Bands, belly, straps, long.—To be looped to the bearing bar of the gun hanger on the gun set, and the tripod hanger on the tripod set, by passing up behind the bearing bars of the respective hangers, and then through their own fixed loops, the loops remaining at the upper edge of the bearing bars.

Bands, belly, straps, short.—To be looped to the near-side bar of the adjustable tree on the gun set, and the off-side bar of the adjustable tree of the tripod set, in a similar manner to that of the long strap, but the loops are to remain at the lower edge of the side-bars.

Bands, belly, straps, supporting.—To be looped up through the slot in the "lay" of the pannel on either side of gun or tripod sets.

The **belly band** is afterwards buckled to these straps, and is supported by them whenever it is released from its long and short straps ; it would otherwise drop to the ground.

Straps, pick and helve.—Looped to the bearing bar of the tripod hanger by passing down behind the bearing bar, and then through their own fixed loops.

Straps, detachable, shovel.—To be looped to the rear arch (near side) of the gun set, and the rear arch (off side) of the tripod set.

Saddling.—Before saddling it is essential that the animal's back should be free from dirt, and any dried sweat or matted hair brushed out. The pannels should be thoroughly dried, beaten, and freed from any dirt or grit before being placed on the animal's back. Neglect of these precautions is the most fertile source of sore backs. Constant attention must be paid to the stuffing of the pannels, and care taken to prevent them from becoming hard and lumpy.

When possible, animals should not be kept standing longer than is necessary when saddled and loaded.

If a saddle has shifted, do not try to push it into a better position ; off-load, off-saddle, and re-saddle properly.

Do not allow men to hang their rifles or equipment on the loads, or hold on to them on the march.

Girths may, if wished, be crossed under the animal's belly, and this method is often useful when there is a tendency for the girths to slip. When the girths are fastened the buckles should rest on the lower edges of the pannels, as this will prevent buckle galls.

The breeching and breast collar should be so fitted that movement of the animal is not impeded. Constant rubbing of either of these articles, when fitted too tightly, will inevitably cause galls.

The crupper requires careful fitting, as otherwise the animal's neck will be galled. A good rough guide is to arrange that the breadth of the hand will pass between the body of the breeching and the body of the crupper.

The bridoon bit should hang low enough to prevent the corners of the animal's mouth from being wrinkled.

6. Packsaddle drill (Infantry).

Instructor's Notes

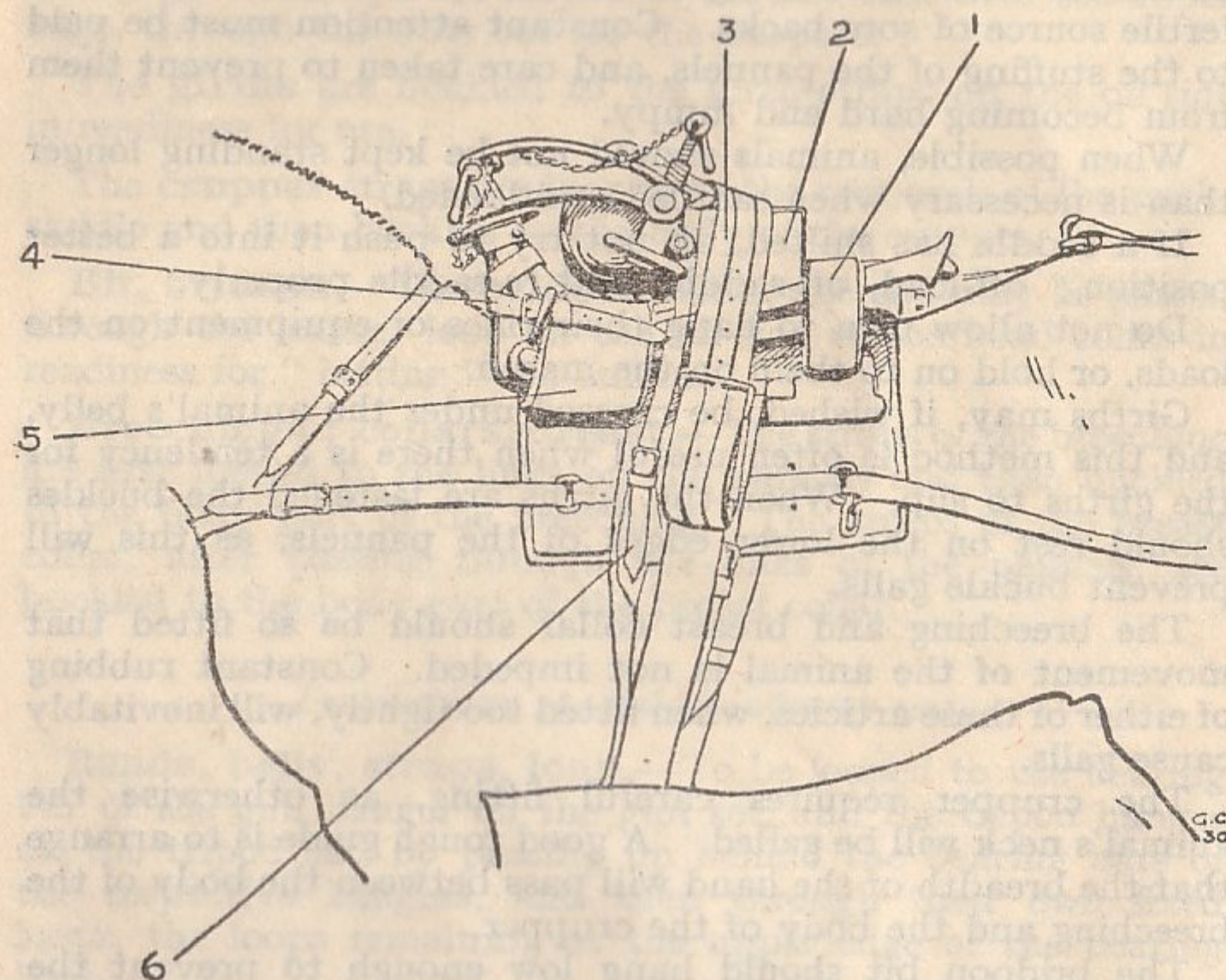
Stores:—

Two pack animals fitted with pack saddles, and feeds. Tripod, gun, condenser can and tube, spare parts case, cleaning rod, one cases, cans, oil, eight belt boxes, one gun hanger, one tripod hanger, two surcingles web, two ammunition racks, one water bucket.

PLATE 19

INFANTRY—GUN PACK ANIMAL

(Near side)

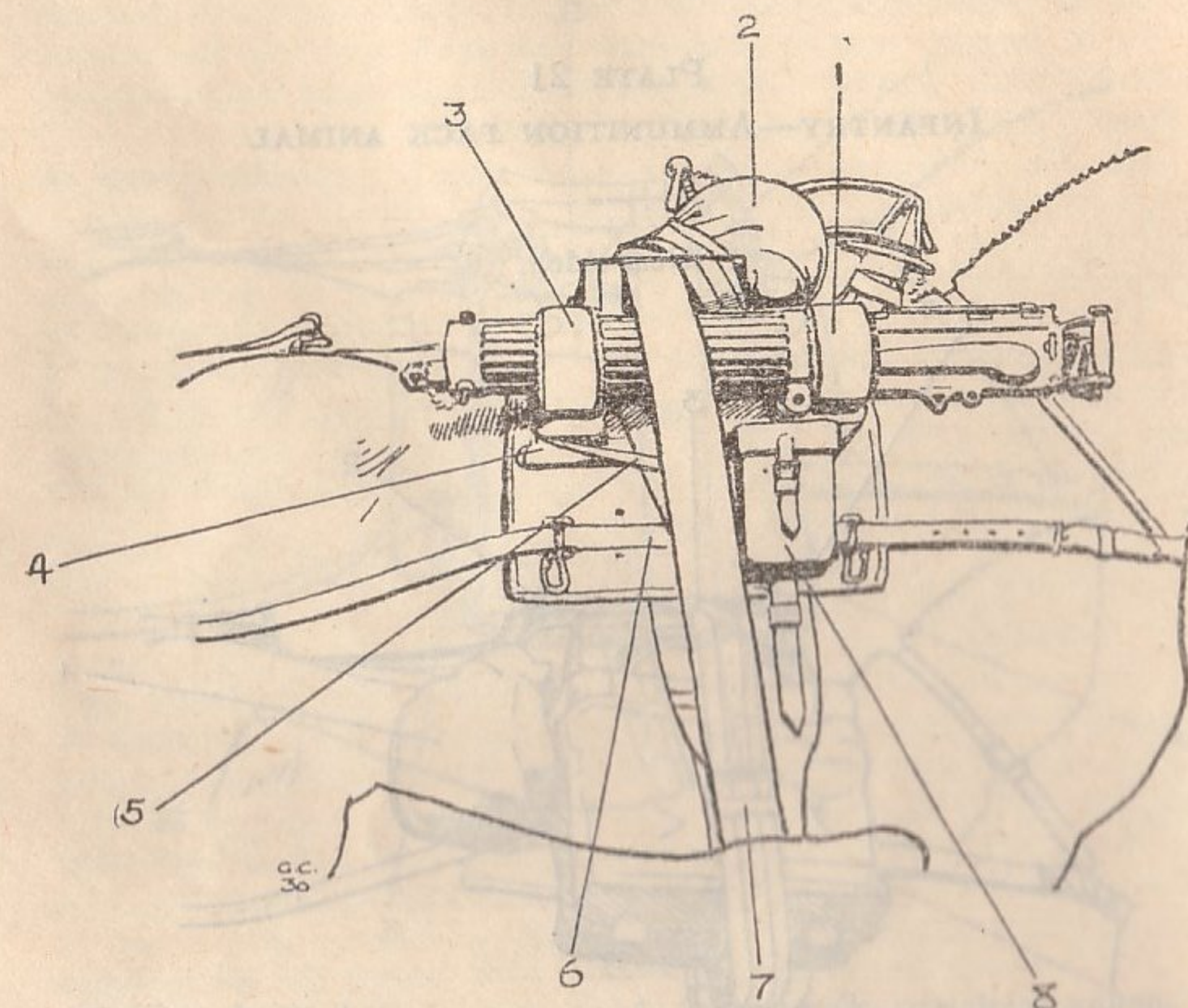


KEY

- | | |
|------------------------------|--------------------------------|
| 1. Rear hanger sling tripod. | 4. Strap securing tripod. |
| 2. Ammunition box. | 5. Front hanger sling tripod. |
| 3. Web surcingle. | 6. Securing strap tripod legs. |

 PLATE 20
 INFANTRY—GUN PACK ANIMAL

(Off side)



KEY

- | | |
|----------------------------|-------------------------|
| 1. Front hanger sling gun. | 5. Securing strap, gun. |
| 2. Nosebag. | 6. Lay on. |
| 3. Rear hanger sling gun. | 7. Web surcingle. |
| 4. Hanger bar. | 8. Spare parts case. |

LOAD TABLES—PACK (INFANTRY)

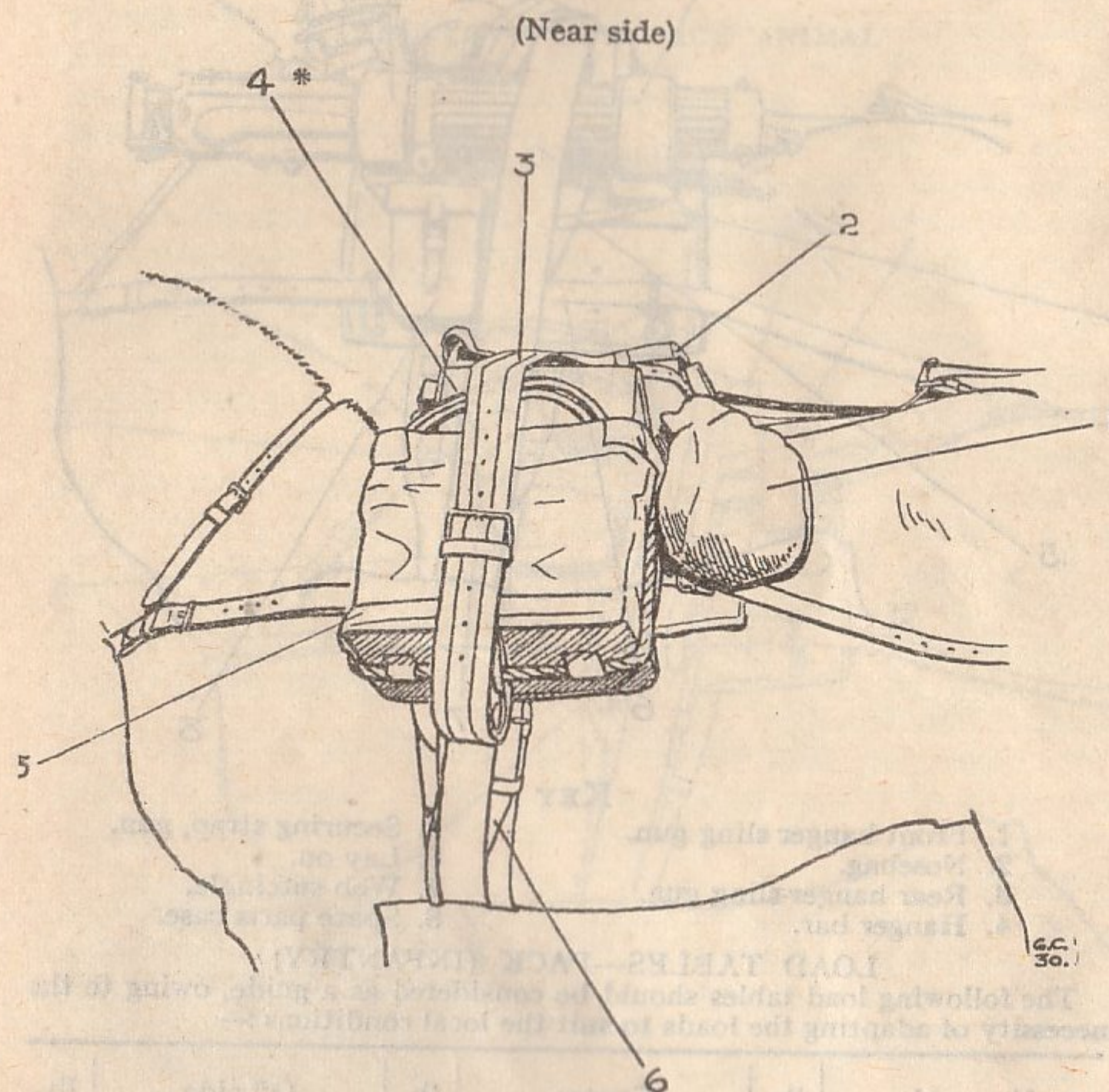
The following load tables should be considered as a guide, owing to the necessity of adapting the loads to suit the local conditions :—

Near side	lb.	Centre	lb.	Off side	lb.
GUN PACK					
Tripod	52	Ammunition box (stripless) ..	43	Gun, with barrel casing (filled) ..	42
Hanger, tripod, sling	9	Nose-bag (filled) ..	8	Hanger, gun, sling ..	8
		Case, horseshoe (filled) ..	3	Cleaning rod ..	1
				Spare parts case ..	8
Total	61	Total	54	Total	59

Recapitulation of weights

	lb.
Near side	61
Centre	54
Off side	59
Pack saddle	28
Grand total	202

PLATE 21
INFANTRY—AMMUNITION PACK ANIMAL

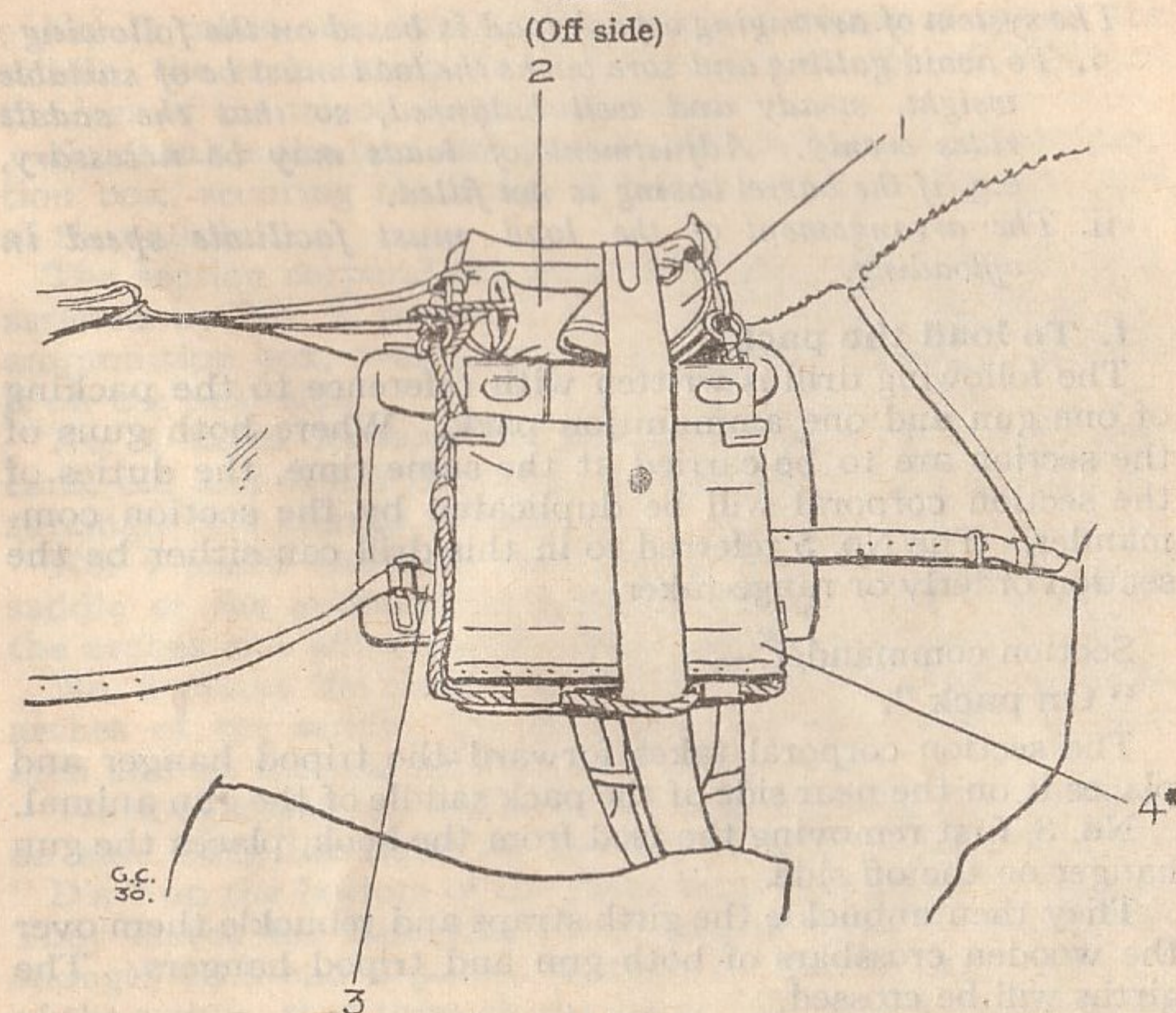


KEY

1. Nosebag.
2. Cases, can, oil.
3. Surcingle.
4. Condenser can, with tube.
5. Canvas rack containing ammunition boxes.
6. Steadying strap (leather girths).

* With large size ammunition containers (metal), instead of two ammunition containers being packed horizontally, these will be packed vertically and the condenser can carried on top of the pack saddle.

INFANTRY—AMMUNITION PACK ANIMAL



KEY

1. Case, horse shoe.
2. Canvas bucket.
3. Lay on.
4. Canvas rack, containing ammunition boxes.

* With large size ammunition containers, three will be packed vertically instead of four, the fourth being carried in near side rack (see note to Plate 21).

Near side	lb.	Centre	lb.	Off side	lb.
2 boxes, belt (single) ..	42	AMMUNITION PACK Bucket, canvas	1	4 boxes, belt (single) ..	84
Rack canvas ..	6			Rack canvas ..	6
Case, can, oil ..	8			Case, horseshoe (filled) ..	3
Nose-bag (filled)	8				
Condenser can ..	25				
" tube ..	1½				
Carrier ..	3				
Total ..	93½	Total ..	1	Total ..	93

Recapitulation of weights

	lb.
Near side ..	93½
Centre ..	1
Off side ..	93
Pack saddle ..	28
Grand total ..	215½

The system of arranging a pack load is based on the following :

- i. *To avoid galling and sore backs the load must be of suitable weight, steady and well balanced, so that the saddle rides evenly. Adjustment of loads may be necessary, e.g. if the barrel casing is not filled.*
- ii. *The arrangement of the load must facilitate speed in offloading.*

i. To load the pack.

The following drill is written with reference to the packing of one gun and one ammunition pack. Where both guns of the section are to be carried at the same time, the duties of the section corporal will be duplicated by the section commander. The No. 5 referred to in this drill can either be the section orderly or range-taker.

Section commander.—

“ On pack ”.

The section corporal takes forward the tripod hanger and places it on the near side of the pack saddle of the gun animal.

No. 3, first removing the feed from the hook, places the gun hanger on the off side.

They then unbuckle the girth straps and rebuckle them over the wooden crossbars of both gun and tripod hangers. The girths will be crossed.

No. 3 takes the spare parts case and hangs the sling strap of the case over the two hooks on the off side of the saddle, adjusting the length of the strap, if necessary, so that the top of the case will just touch the bottom of the gun when it is in the slings.

No. 1 takes the tripod, and, with the assistance of the section corporal, places it in the rear side slings, legs to the rear, crosshead leaning towards the front arch. No. 1 and the section corporal buckle the securing straps. Care must be taken that no inner jamming handle is turned back on to the leather pannel of the saddle.

No. 2 takes the gun, and, with the assistance of No. 3, who takes up the cleaning rod, places it in the off side slings, muzzle to the rear, the front sling being passed over the feed block and the rear sling over the barrel casing.

Nos. 1 and 2 fix the straps, long and short, which are on the bars of the hangers, round the tripod legs and gun respectively, and buckle them on to the steadying strap.

No. 2 buckles the securing straps.

No. 3 then takes the cleaning rod and pushes it through the gun slings, front to rear, where the metal rings are held by the leather slings.

No. 3 takes one double belt box and places it across the saddle, the ends fitting between the gun on the off side and the legs of the tripod on the near side.

No. 2 takes the feed and places it on the top of the ammunition box, securing the strap of the nosebag to the rear arch of the saddle.

The section corporal brings forward the web surcingle, and, assisted by No. 2, passes it through the metal straps of the ammunition box, over the feed, and under the belly, securing it on the near side.

No. 4 takes forward the full ammunition rack and case, cans, oil, and No. 5 the other loaded rack, together with the surcingle and canvas bucket.

No. 4 places the case, cans, oil, between the arches of the saddle of the ammunition animal, passing the strap around the arches and adjusting the length of the strap as necessary.

No. 5 places the canvas bucket between the front and rear arches of the saddle, the rope handle going under the rear arch and on the rear off side hook of the tree.

Working together, No. 5 on the near side and No. 4 on the off side hang the racks on the pack saddle hooks, the metal “ D’s ” on the bottom of the racks being nearest to the animal. They fasten the steadying strap (leather girth). When long enough, each end is passed through the slot in the “ lay on ” of the saddle, then through the metal “ D ” in the rack and the strap is buckled.

No. 5 fastens the other feed from the gun animal on to the rear arch on the near side.

Nos. 4 and 5 pass the web surcingle round the two racks, over the condenser can and ammunition boxes, and under the animal’s belly and buckle it on to the near side.

NOTE.—There is no provision for carrying certain parts of the machine gun equipment, e.g. the range-finder, spare parts box, or the indirect fire equipment, and the amount of ammunition carried is limited. The range-taker will carry his instrument in the canvas case. Any additional equipment required must be carried by the gun animal.

ii. To off load the pack.

Section commander.—

“ Off pack ”.

The numbers detailed in “ On pack ” will take off the stores.

The order in which they are taken off will be the reverse to “ On pack ”.

iii. To prepare for action (pack).

Section commander.—

"Prepare for action".

Nos. 1 and 2 double to the gun and tripod pack and remove the tripod and gun respectively.

No. 3 doubles to the gun and tripod pack and removes the box of ammunition, spare parts case and cleaning rod. He hands the spare parts case to No. 2.

No. 4 doubles to the ammunition pack, removes two metal belt boxes from the off side, and the condenser can and tube from the near side.

He hands the condenser can to No. 3 and tube to No. 2.

If more ammunition is required, No. 5 will remove the same and pass it to No. 4.

The section corporal organizes loads as necessary, and with No. 5 squares off all loose gear and straps after the stores have been removed.

iv. To come into action.

Section commander.—

"Action".

Nos. 1, 2 and 3 act as in E.G.D.

v. To cease firing.

Section commander.—

"Cease firing".

Nos. 1, 2 and 3 act as in E.G.D.

When signalled for, the pack animals, under orders of the section corporal, move forward to a position immediately in rear of the gun position, and the packs prepared to receive the equipment.

Section commander.—

"On pack".

The numbers will load the packs as in paragraph 6, i, above.



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